REGION 1

RECORD OF DECISION

TROY MILLS LANDFILL SUPERFUND SITE
TROY, NEW HAMPSHIRE

SEPTEMBER 2005

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DECLARATION FOR THE RECORD OF DECISION

A. SITE NAME AND LOCATION

Troy Mills Landfill Superfund Site
Troy, New Hampshire
CERCLIS ID No. NHD980520217

B. STATEMENT OF BASIS AND PURPOSE

This decision document by the United States Environmental Protection Agency (EPA) Region I presents the selected remedial action for the Troy Mills Landfill Superfund Site (Site), in Troy, New Hampshire, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC § 9601 *et seq.*, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 *et seq.*, as amended. The Director of the Office of Site Remediation and Restoration (OSRR), EPA Region I has been delegated the authority to approve this Record of Decision.

This decision was based on the Administrative Record, which has been developed in accordance with Section 113 (k) of CERCLA, and which is available for review at the Gay-Kimball Public Library in Troy, New Hampshire and at the EPA Region 1 OSRR Records Center in Boston, Massachusetts. The Administrative Record Index (Appendix D to the ROD) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

The State of New Hampshire, through the State of New Hampshire Department of Environmental Services, concurs with the Selected Remedy.

C. ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

D. DESCRIPTION OF THE SELECTED REMEDY

This ROD sets forth the selected remedy for the Troy Mills Landfill Site, which involves allowing naturally occurring processes to continue reducing contaminant concentrations in groundwater (i.e., monitored natural attenuation); continuing the capture and removal of free product from groundwater in a series of interceptor trenches constructed by EPA in 2003, as part of a CERCLA drum removal action that has been incorporated into this final remedy; maintaining a permeable soil cap that was constructed by EPA in July-August 2005, as part of the CERCLA removal action, over a drum excavation area; and the establishment and

maintenance of institutional controls. Long-term monitoring of groundwater, surface water, sediment, leachate, and wetlands will be necessary to ensure the effectiveness of the remedy. Institutional controls will be established to: 1) restrict the use of contaminated groundwater for drinking water purposes until restoration to drinking water standards is achieved; 2) restrict activities that would disturb the permeable soil cap; 3) prevent the disturbance of remedy components until they are no longer needed; and 4) require notification of any changes in the use of the property on which the Site is located. This remedy is intended to address human health risks posed by contaminated groundwater and light non-aqueous phase liquid (LNAPL) at the Site. Contaminated groundwater and LNAPL pose a potential threat to human health if not addressed. There are no significant risks to ecological receptors posed by the Site.

The selected remedy is a comprehensive approach for this Site that addresses all current and potential future risks caused by groundwater, LNAPL, and soil contamination. Specifically, this remedial action includes the monitored natural attenuation of groundwater contaminants, the maintenance of a series of LNAPL interceptor trenches positioned to capture LNAPL before it discharges into nearby surface water and wetlands, the maintenance of a permeable soil cap, and the use of institutional controls.

The major components of this remedy are:

1. Allowing naturally occurring processes to reduce contaminant concentrations in groundwater;

2. Removing all potential floating free product, LNAPL, before it can reach the nearby wetlands in a series of existing LNAPL interceptor trenches constructed by EPA in 2003;

3. Maintaining a two-foot thick permeable soil cap constructed by EPA in 2005 to prevent potential contact with residual contaminated soil in the former drum disposal area. The permeable cap allows precipitation to infiltrate through and facilitate the cleanup of groundwater;

4. Establishing institutional controls that restrict the use of contaminated groundwater for drinking water purposes until restoration to drinking water standards is achieved; restrict activities that would disturb the permeable soil cap, prevent the disturbance of all remedy components until they are no longer needed, and require notification of any changes in the use of the land; and

5. Implementing a comprehensive monitoring and sampling program to evaluate groundwater, surface water, sediment, leachate, and wetlands to ensure that natural attenuation processes are continuing as expected;

The selected response action addresses principal and low-level threat wastes at the Site by: restoration of groundwater to drinking water quality through monitored natural attenuation,

elimination of LNAPL through its capture and collection in interceptor trenches, prevention of direct contact with contaminated soil through maintenance of a permeable soil cap, and the implementation of institutional controls.

E. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action (unless justified by a waiver), is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Based on the recent drum removal action by EPA's Removal Program, which eliminated the primary source on ongoing contamination at the Site (e.g., 7,692 drums); the remote location of the Site; the lack of current human health risks; and the relatively low levels of residual contamination remaining in groundwater, leachate, and soils, EPA concluded that it was impracticable to remove and treat the remaining chemicals of concern in a cost-effective manner. Thus, the selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy.

Because this remedy will result in hazardous substances remaining on-Site above levels that allow for unlimited use and unrestricted exposure (and groundwater and/or land use restrictions are necessary), a review will be conducted within five years after initiation of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

F. ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this Site.

1. Chemicals of concern (COCs) and their respective concentrations (Section G.1 of this ROD)

2. Baseline risk represented by the COCs (Section G.1 of this ROD)

3. Cleanup levels established for COCs and the basis for the levels (Section L.5 of this ROD)

4. Current and future land and groundwater use assumptions used in the baseline risk assessment and ROD (Sections F.1 and F.2 of this ROD)

5. Land and groundwater use that will be available at the Site as a result of the selected remedy (Section L.4 of this ROD)

6. Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (Section L.3 of this ROD)

7. Decisive factor(s) that led to selecting the remedy (Section L.1 of this ROD)

G. AUTHORIZING SIGNATURES

This ROD documents the selected remedy for groundwater, LNAPL and soil at the Troy Mills Landfill Superfund Site. This remedy was selected by EPA with concurrence of the New Hampshire Department of Environmental Services.

Concur and recommended for immediate implementation:

U.S. Environmental Protection Agency

By: _____ Date: 9-30-05

Rich Cavagnero
Deputy Director
Office of Site Remediation and Restoration
Region 1

A. SITE NAME, LOCATION AND BRIEF DESCRIPTION

- Troy Mills Landfill Superfund Site
  Off Rockwood Pond Road
  Troy, Cheshire County, New Hampshire 03465

- CERCLIS ID No. NHD980520217

- EPA Lead RI/FS and ROD

- Former Drum Disposal Landfill

- Brief Site description

The Troy Mills Landfill Superfund Site (the Site) is a two-acre former drum disposal area located approximately 1.5 miles south of the center of Troy, New Hampshire. The two-acre Site is located in the southeastern corner of a larger 270-acre parcel (the property). The Site is surrounded primarily by undeveloped woodlands, a gravel access road to the west, and a former railroad bed currently used as a recreational trail to the east. Rockwood Brook flows south to north a short distance to the west of the Site and continues downstream to Sand Dam Pond, where the Town of Troy's recreational swimming area is located. The nearest residences are approximately ½ mile from the Site.

The Site was used by Troy Mills, Inc. to dispose of drums of hazardous substances that were generated at its manufacturing facility in the center of town. The manufacturing facility and the 270-acre parcel were owned by Troy Mills, Inc. Immediately to the north of the Site is a separate eight-acre solid waste landfill, regulated by the New Hampshire Department of Environmental Services (NHDES), which was used for the disposal of waste fabric scraps and other miscellaneous solid waste from the former mill. The manufacturing facility and the solid waste landfill are not considered part of the Site.

A more complete description of the Site can be found in Section 1.2 of the Remedial Investigation (RI) Report. Attached Figures 1-1, 1-2, 1-4, and 1-5 taken from the RI Report shows the location of the Site and depicts key Site features.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

1. History of Site Activities

From 1967 to 1978, Troy Mills, Inc., a manufacturer of acrylic fabrics for the automotive industry, disposed of an estimated 6,000 to 10,000 55-gallon drums of waste liquid and sludge containing mostly plasticizers such as bis(2-ethylhexyl)phthalate (BEHP) and a petroleum-based solvent known as Varsol™ (which contained Stoddard solvent and mineral spirits). The drums

were buried in a two-acre area of the larger 270-acre property and covered with clean sand from a nearby sand quarry.

Other drummed wastes included pigments (containing metals such as zinc, chromium, and cadmium), surplus mixes and tank residues of vinyl resins, paint resins, and top-coating products. An average of 15 to 20 drums per week were dumped from trucks into trenches and compacted under the weight of heavy equipment. The adjacent former solid waste landfill (approximately eight acres) contains primarily discarded synthetic fabrics and other types of solid waste from Troy Mills' operations.

From 1979 to the present, numerous investigations related to the Troy Mills Landfill Site have been conducted. These studies have included geophysical/magnetic surveys, test pitting, and sampling of drums, groundwater, leachate, surface soil, surface water, and sediment in and around the former drum disposal area. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganics have been detected in all of these matrices, and the analytes detected (phthalates, petroleum-based compounds, and metals) are consistent with the historical account of materials buried at the Site.

A more detailed description of the Site history can be found in Section 1.2.2 of the RI Report.

2. History of Federal and State Investigations and Removal and Remedial Actions

As noted in the previous section, numerous investigations related to the Troy Mills Landfill Site have been conducted. Most of these investigations were performed by Troy Mills, Inc. under State of New Hampshire authority. Environmental investigations conducted throughout the 1980s documented the presence of contamination at the Site emanating from the release of hazardous wastes from the buried drums. Risk assessments completed in 1991 determined that VOCs in groundwater posed a then current risk to human health. Remedial engineering studies conducted from 1995-1998 recommended a containment strategy which included the construction of an impermeable cap over the former drum disposal area and a downgradient slurry wall with flow-through treatment gates to address contaminated groundwater. In 2000, several months after NHDES approval of a modified containment remedy with provision for removal and treatment of contained contamination, Troy Mills, Inc. requested that NHDES defer remediation of the former drum disposal area due to unfavorable corporate and financial market conditions. The deferral was subsequently approved by NHDES. Troy Mills, Inc. filed for Chapter 11 bankruptcy in 2001.

Following the Troy Mills, Inc. bankruptcy filing, NHDES referred the Site to the EPA Region 1 Emergency Planning and Response Branch in 2001 to have the Site evaluated for a removal action. At the same time, EPA began evaluating the Site for listing on the Superfund National Priorities List (NPL). In September 2003, the Site was listed on the NPL and a time-critical removal action was initiated. The first phase of the removal action included the

installation of three LNAPL interceptor trenches to capture free product floating on the groundwater. The second phase of the removal action, which was initiated in July 2004, involved the excavation of 7,692 buried drums, the removal of 29,924 gallons of flammable liquid waste and 3,099 cubic yards of sludge, and the excavation of 26,244 tons of heavily contaminated soil which were all transported off-Site for disposal at permitted facilities. In the spring and summer of 2005, EPA completed its time-critical removal action with the construction of a two-foot thick permeable soil cap over the excavation area to prevent direct contact risks to underlying residual contaminated soils.

The following list summarizes all major EPA and NHDES investigation and cleanup activities at the Site to date.

- In 1978, an inspection of the property by the New Hampshire Bureau of Solid Waste Management (NH BSWM) documented the disposal of drums at the Site. Subsequently, NH BSWM wrote to Troy Mills, Inc. informing Troy Mills, Inc. that they were operating an unauthorized dump site. NH BSWM instructed the company that dump operations must either cease or be licensed through a sanitary landfill application and permit process.

- On October 5, 1979, Troy Mills, Inc. applied for a permit to operate a sanitary landfill. On October 24, 1979, NH BSWM approved the Troy Mills, Inc. sanitary landfill permit request for disposal of waste acrylic fabrics and empty 55-gallon drums. Wastes specifically excluded included waste solvents, oils, and plasticols.

- In 1980, inspections of the sanitary landfill operation by NH BSWM documented the presence of leachate emanating from the "lower dump area" (synonymous with the two-acre former drum disposal area that comprises the Site). NH BSWM issued notice to Troy Mills, Inc. in October 1980 to conduct an investigation of the area and submit an abatement plan to protect groundwater and surface water, as appropriate.

- From 1981 through 1998, several environmental engineering firms, under contract to Troy Mills, Inc. conducted a series of Site investigations, risk assessments, and pre-design studies. These are summarized below:

    - Normandeau Associates, Inc. (NAI). 1981. *Troy Mills Landfill, Troy, New Hampshire: Phase I Report.* Five test pits were excavated to observe upper soils. No buried drums were encountered in any of these test pits. Three surface water samples were collected (upstream, downstream, and leachate seep) for organic and inorganic chemical analyses. Analyses of the leachate sample gave some indication of contaminants being released from the drum disposal area.

    - NAI. 1981. *Geophysical Investigations at the Troy Mills Landfill, Troy, New Hampshire: Phase II Report.* A seismic geophysical survey was conducted of

the area suspected of containing buried drums. A groundwater table contour map and a limited topographic Site plan were prepared. The report recommended drilling four monitoring wells.

- NAI. 1982. *Test Drilling, Installation of Monitor Wells, and Water Quality Assessment, Troy Mills Landfill, Troy, New Hampshire: Phase III Report.* Four monitoring wells were installed. Groundwater and surface water sampling was initiated. Analytical results indicated that the groundwater was contaminated with VOCs (total VOCs < 45 ppb) and inorganics at detectable levels. The report recommended continued sampling of groundwater and surface water.

- NAI. 1984. *Landfill Investigation and Waste Characterization, Troy Mills Landfill, Troy, New Hampshire.* Based on the Phase II Investigation seismic geophysical survey results, 17 test pits were excavated in the drum disposal area. Of the 45 drums observed, 15 were crushed flat, 4 were partially crushed but capable of containing wastes, and 26 appeared intact and structurally sound. NAI estimated that the drum disposal area contained 11,429 drums. Analytical results of samples from the drums and/or containerized wastes indicated the presence of eight VOCs, four SVOCs, and three metals.

- NAI. 1984. *Letter Report of Water Quality Monitoring, Troy Mills Landfill, Troy, New Hampshire.* Results of additional seismic monitoring, topographic survey, groundwater, and water quality monitoring were reported. Low levels (140 ppb) of trichloroethane (TCA) were detected in groundwater. No VOCs were detected in the surface water samples.

- NUS Corporation. 1985. *Troy Mills Landfill Site Inspection Report, Troy Mills Landfill, Troy, New Hampshire.* NUS collected groundwater samples from monitoring wells located downgradient of the drum disposal area; surface soil samples from the drum disposal area; surface soil and leachate/sediment samples from the drum disposal area leachate seep and downgradient; and surface water samples from Rockwood Brook. VOCs were detected in the leachate and groundwater samples.

- Charles T. Main, Inc. 1986. *Level I Human Health Risk Assessment - Troy Mills Landfill, Troy New Hampshire.* This study concluded that a Level 2 Risk Assessment should be conducted since concentrations of VOCs in groundwater showed risk.

- ChemCycle Corporation and GEI Consultants, Inc. (GEI). 1988. *Draft Remedial Investigation, Rockwood Brook Landfill, Troy, New Hampshire.* This study included topographic, magnetic, electromagnetic, and seismic surveys; a summary of data from 47 test pits (solid waste landfill and drum disposal area),

stream discharge monitoring data, installation logs and water quality data from 18 new monitoring wells, and air emission assessment data; a vegetative stress assessment; and a baseline risk assessment. The report concluded that no significant concentrations of residual constituents of concern were present in Rockwood Brook or the groundwater near the brook, and that there were no impacts on the quality of Rockwood Brook from the Site.

- Menzie-Cura & Associates and GEI. 1991. *Risk Assessment Rockwood Brook Landfill.* The report concluded that there was no demonstrable risk to human health or aquatic biota under prevailing steady state conditions. In an accelerated release scenario evaluated in the risk assessment, the concentration of toluene (the most prevalent VOC in the groundwater identified at that time), would have to be five orders of magnitude greater than the maximum concentration detected to result in an unacceptable risk to the most sensitive potential receptor (children swimming in Sand Dam Pond).

- GEI. 1992. *Draft Feasibility Study, Rockwood Brook Landfill, Troy, New Hampshire.* A recommended remedy was proposed in the draft study report which was based on the conclusion that unacceptable risks to human health or the environment would result only under extraordinary conditions. The recommended remedy consisted of capping the drum disposal area; a groundwater monitoring program including the installation of additional monitoring wells to provide indications of changes in groundwater quality that may affect Rockwood Brook; and, if necessary, implementation of groundwater recovery and treatment in response to potential future increases in groundwater contaminant concentrations that may ultimately increase risks to human health and the environment.

- GEI. 1995. *Phase I Pre-Design Studies - Rockwood Brook Landfill, Troy, New Hampshire.* An electromagnetic geophysical survey was conducted to re-establish the approximate location of the buried drums in the drum disposal area. The analysis of waste samples from test pits within the drum disposal area indicated the presence of VOCs, SVOCs, and metals. Eleven new monitoring wells were installed, and LNAPL was observed in two wells (MW201S and MW203S). The study included a computer model of contaminant fate and transport.

- GeoInsight, Inc. (GII). 1998. *Technical Memorandum, Phase II Pre-Design Investigation, Rockwood Brook Landfill, Troy, New Hampshire.* The Phase II report described the June 1998 installation of two additional monitoring wells (MW201M and MW301, downgradient and cross-gradient from the drum disposal area) and two piezometers (P1 and P2, south of the drum disposal area). The pre-design objective was to determine whether Site conditions would sustain

installation of a downgradient, hanging slurry wall combined with product collection and a flow-through treatment gate to address the LNAPL that was newly discovered in the 1995 GEI investigation.

- GII. 1998. *Phase II Pre-Design Report and Groundwater Management Permit Application, Rockwood Brook Landfill, Troy, New Hampshire.* GII provided the pre-design engineering to evaluate remedial alternatives for the Site, and proposed the installation of the hanging slurry wall combined with product collection and a flow-through (intrinsic) treatment gate downgradient of the drum disposal area and the location of the leachate outbreak.

- As noted earlier, in 2000, NHDES approved a deferral request by Troy Mills, Inc. The company requested to defer remediation of the drum disposal area due to unfavorable corporate and financial market conditions. In 2001, Troy Mills, Inc. filed for Chapter 11 bankruptcy.

- In 2002, EPA completed a removal Preliminary Assessment/Site Investigation (PA/SI) in response to NHDES' referral of the Site to EPA Region I's Emergency Planning and Response Branch. The removal PA/SI included a geophysical survey to delineate the approximate boundary of the drum disposal area and to identify possible test pit locations.

- In 2003, EPA completed an Expanded Site Investigation Report to collect additional data needed to evaluate the potential to propose the Site to the NPL. Fourteen test pits were excavated and more than 20 intact or crushed drums were encountered at various depths between zero and eight feet below ground surface (bgs) within the drum disposal area. Six of the drums were noted to contain either liquid or sludge.

- In September 2003, the Site was listed on the NPL and a time-critical removal action was initiated. The first phase of the removal action included the installation of three LNAPL interceptor trenches to capture free product floating on the groundwater.

- From July 2004 until the summer of 2005, the second phase of the time-critical removal action was conducted, which involved the excavation of 7,692 buried drums, the removal of 29,924 gallons of flammable liquid waste and 3,099 cubic yards of sludge, and the excavation of 26,244 tons of heavily contaminated soil. All of this material was transported off-Site for disposal at permitted facilities. Soil that met contaminant screening levels were segregated from the materials to be disposed of and then backfilled into the excavation. Post excavation sampling was conducted to determine if contaminated soils remained that required excavation and off-Site disposal.

- In the spring and summer of 2005, EPA completed its time-critical removal action with the construction of a two-foot thick permeable soil cap over the backfilled soils in the drum excavation area to prevent direct contact risks to underlying residual contaminated soils.

- In July 2005, EPA completed further studies at the Site and prepared a Remedial Investigation (RI) Report. As part of the RI, EPA collected and analyzed surface water and sediment samples from nearby Rockwood Brook and the surrounding wetland, referred to as the Rockwood Brook Wetland Study Area. EPA also evaluated current and historical groundwater data, collected and analyzed air and soil samples from locations throughout the Site, and evaluated analytical data collected over the course of the drum removal action. Attached Figure 2-3 taken from RI Report depicts the RI sampling locations.

The RI found a plume of groundwater contamination, approximately 8-9 acres in size, which includes the area beneath the two-acre former drum disposal area. Organic contaminants such as alkylbenzenes, chlorinated solvents, phthalates, and toluene are the primary chemicals of concern in the groundwater. The RI also indicates that most of these organic contaminants are biodegrading naturally. The RI confirms that removing the buried drums from the former disposal area has eliminated the primary source of ongoing contamination to groundwater.

The RI documented the presence of LNAPL and LNAPL-contaminated leachate at the Site. The RI found that the LNAPL interceptor trenches installed in 2003 are working effectively to capture LNAPL before it migrates into the adjacent wetlands and are reducing contaminant concentrations in the leachate. EPA's assessment of the adjacent wetland area (a.k.a., the Rockwood Brook Wetland Study Area) found no contaminant concentrations at levels that pose a potential risk to human health and the environment under current use scenarios. However, if residential development of portions of the 270-acre property in close proximity to the Site occurs, more intensive recreational use of the Site may follow, resulting in a potential future risk.

The two-foot permeable soil cap over the former drum disposal area prevents potential direct contact risks to underlying residual contaminated soils. In addition, the RI found that the permeable soil cap is allowing precipitation to infiltrate to the groundwater and is aiding the natural groundwater contaminant biodegradation processes that are already occurring.

- In July 2005, EPA also completed a Feasibility Study (FS) for the Site to evaluate various cleanup alternatives to address groundwater, LNAPL/leachate, and residual soil contamination at the Site.

- Also in July 2005, EPA issued a Proposed Plan for public comment which described the proposed remedy for the Site.

3. History of CERCLA Enforcement Activities

To date, investigations show that Troy Mills, Inc. was the owner and operator of the former drum disposal area and was the sole entity to dispose of drums at the Site during the limited period of its operation.

On October 10, 2001, Troy Mills, Inc. filed a petition in bankruptcy under Chapter 11 of Title 11 of the Bankruptcy Code, 11 U.S.C. § 101, *et seq.*, as amended, in the United States Bankruptcy Court for the Northern District of West Virginia. (*In re: Troy Mills, Inc.*, Bankr. No. 01-13341). On Feb 8, 2002 the United States filed a Rule 9010 Notice of Appearance to the Bankruptcy Court.

On November 20, 2001, EPA verbally notified Troy Mills, Inc. of its potential CERCLA liability with respect to the Site. On November 20, 2001, Troy Mills, Inc. signed an access agreement permitting EPA to conduct response actions at the Site.

On December 23, 2003, the bankruptcy was converted to Chapter 7, and a Chapter 7 bankruptcy trustee was appointed. On March 19, 2004, the United States filed a proof of claim with the Bankruptcy Court to recover the Government's incurred and to be incurred CERCLA response costs for the Site. The United States has been negotiating with the bankruptcy trustee to resolve its outstanding claims. On July 21, 2005, the Bankruptcy Court issued an order which provided the bankruptcy trustee the authority to enter into a settlement agreement with the United States. A settlement agreement is pending.

EPA has issued information requests to Troy Mills, Inc.; the Chapter 7 bankruptcy trustee; and number of insurance companies which had written policies to Troy Mills, Inc. to acquire additional information about the company's practices and insurance coverage at the Site.

Neither Troy Mills, Inc., the potentially responsible party (PRP), nor the bankruptcy trustee have been active in the remedy selection process for this Site.

C. COMMUNITY PARTICIPATION

Throughout the Site's history, community concern and involvement has been high. The EPA and NHDES have kept the community and other interested parties apprised of Site activities through informational meetings, fact sheets, press releases, open houses, and public meetings. Below is a brief chronology of public outreach efforts to date:

- As part of the drum removal action conducted by EPA since 2003, EPA has held public informational meetings, conducted press events and tours of the Site for the

public and members of the New Hampshire Congressional delegation, and issued press releases at key points of the removal action.

- In July 2005, the EPA released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in RI/FS and Proposed Plan activities.

- On July 13, 2005, EPA made the Proposed Plan and administrative record available for public review at EPA's offices in Boston and at the Gay-Kimball Public Library in Troy, New Hampshire. This is the primary information repository for local residents and has been kept up to date by EPA since the initiation of removal activities at the Site.

- On July 15 and 22, 2005, EPA published a legal notice and brief analysis of the Proposed Plan in the *Keene Sentinel* and made the plan available to the public at the Gay-Kimball Public Library in Troy, New Hampshire.

- On July 20, 2005, EPA held an informational meeting to discuss the results of the Remedial Investigation and the cleanup alternatives presented in the Feasibility Study and to present the Agency's Proposed Plan to a broader community audience than those that had already been involved at the Site. At this meeting, representatives from EPA and NHDES answered questions from the public.

- From July 21 to August 19, 2005, the Agency held a 30-day public comment period to accept public comment on the alternatives presented in the Feasibility Study and the Proposed Plan and on any other documents previously released to the public.

- Throughout the Remedial Investigation and Feasibility Study process, EPA prepared a Reuse Assessment in consultation with the Troy Board of Selectmen to identify the reasonably-anticipated future land use at the Site. In addition, NHDES prepared a Groundwater Use and Value Determination (also in consultation with the Troy Board of Selectmen) to identify the potential beneficial groundwater uses at the Site.

- On August 18, 2005, the Agency held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting and the comments and the Agency's response to comments are included in the Responsiveness Summary, which is part of this Record of Decision (Part 3).

D. SCOPE AND ROLE OF THE RESPONSE ACTION

The selected remedy was developed by combining components of different source control and management of migration alternatives to obtain a comprehensive approach for Site remediation. In summary, the remedy addresses contaminated groundwater, LNAPL, and residual soil contamination that remain after completion of the LNAPL and drum removal action. With the primary source (i.e., buried drums) removed, monitored natural attenuation is expected to cleanup contaminated groundwater. Maintaining the existing permeable soil cap over the former drum disposal area allows precipitation to infiltrate and re-oxygenate the groundwater, thereby facilitating the naturally-occurring biodegradation processes that are documented in the RI Report. A comprehensive groundwater monitoring program will confirm that natural attenuation processes are occurring as expected. The groundwater monitoring program will also include sampling of leachate seeps and Rockwood Brook surface water, sediment, and wetland soil to confirm that contaminated groundwater is not impacting these areas. Institutional controls will also be established to restrict the use of contaminated groundwater for drinking water purposes until restoration to drinking water standards is achieved, restrict activities that would disturb the permeable soil cap, prevent the disturbance of remedy components until they are no longer needed, and require notification of any changes in the use of the land at the Site.

The principal and low-level threats that this ROD addresses are summarized in the following table:

Table D-1

Principal and Low-Level Threats

Principal Threats	**Medium**	**Contaminant(s)**	**Action To Be Taken**
Direct contact	LNAPL	Bis(2-ethylhexyl)phthalate	Continue to capture LNAPL with existing interceptor trenches
Low-Level Threats	**Medium**	**Contaminant(s)**	**Action To Be Taken**
Ingestion of groundwater	Groundwater	Aromatic VOCs, chlorinated VOCs, manganese	Monitored natural attenuation
Direct contact	Subsurface soil in former drum disposal area	SVOCs	Maintain permeable soil cap over former drum disposal area
Direct contact	Wetland soil	Manganese	Monitoring wetland soils. Require notification if land use changes resulting in potential future recreational risk

E. SITE CHARACTERISTICS

Section 1.0 of the Feasibility Study Report contains an overview of the Remedial Investigation. The significant findings of the Remedial Investigation are summarized below. Refer to the Remedial Investigation Report for complete details.

Field investigation activities were conducted in December 2004 and January 2005, following the excavation of 7,692 drums from the former drum disposal area. Samples were collected from surface and subsurface soil, groundwater (from existing and newly installed monitoring wells), surface water, sediment, and ambient air. Other activities included surveying and LNAPL evaluation.

Groundwater flow in the shallow overburden is to the west-northwest, toward Rockwood Brook. The direction of flow in the deeper part of the aquifer appears to be similar to that in the shallow overburden. In general, vertical gradients are downward or neutral except in areas where groundwater is rising and discharging into a stream or wetland.

The sources of contamination in the environmental media are primarily attributed to past disposal activities at the Site. Elevated concentrations of phthalates were detected in most media sampled. Wetland soils also contained an elevated concentration of manganese. The adjacent wetland is a discharge area for surface water, groundwater, and leachate coming from the former drum disposal area. No remaining soils in and around the former drum disposal area are known to contain contaminants at concentrations above the field screening level used by EPA in consultation with NHDES during the drum removal action. The field screening level was used to segregate excavated soils for off-site disposal. If left on site, these soils had the potential to leach contamination in groundwater. Post-excavation sampling and laboratory analyses conducted by EPA identified no soils with contaminant concentrations above NHDES soil screening criteria and confirmed that soils with the potential to leach contaminants into groundwater had been effectively removed from the Site. Soils that were backfilled into the drum excavation area may retain low levels of contaminants that could pose a risk to human health and the environment if left exposed; however, they do not appear to be a source of contamination to underlying groundwater.

Interceptor trenches were constructed in 2003 by EPA to capture and limit the migration of LNAPL originating from the former drum disposal area into the downgradient wetlands and surface water. Analytical results suggest that the interceptor trenches are limiting migration of the LNAPL, as designed.

Groundwater samples were collected from 18 monitoring wells in the vicinity of and downgradient of the former drum disposal area. Contaminants detected include alkylbenzenes, BTEX (benzene, toluene, ethylbenzene, and xylenes), chlorinated solvents and related compounds, PAHs (polynuclear aromatic hydrocarbons), phenols, phthalates, and metals. Analytical evidence of the degradation of chlorinated ethenes present in Site-wide groundwater is

provided by the presence of cis-1,2-dichloroethene and elevated concentrations of additional breakdown products above the evaluation criteria set forth in U.S. EPA technical protocol. Geochemical indicators provide further evidence that degradation is occurring.

Potential human health risks for carcinogens and/or noncarcinogens were above U.S. EPA's target risk range and hazard index for a future recreational user due to the presence of bis(2-ethylhexyl)phthalate in leachate. Use of the term "leachate" refers to the discolored (reddish) aqueous seep of groundwater discharging to the ground surface immediately downgradient of the LNAPL interceptor trenches. Such discolored seeps are typically associated with buried wastes that cause enhanced mobilization of native metals such as iron and manganese into groundwater. The risks assume that the LNAPL interceptor trenches are not maintained in the future, allowing free-phase groundwater contamination to migrate freely into leachate. As long as the interceptor trenches are maintained properly and operate as designed, future risks and hazards associated with leachate exposures were calculated to be below risk management guidelines.

The EPA target hazard index was exceeded for a future recreational user scenario at the adjacent wetland due to the presence of an elevated concentration of manganese in wetland soil. The future recreational use scenario assumes that the area adjacent to the Site becomes developed for residential use, resulting in a higher degree of potential exposure than is currently occurring at the Site.

There are currently no drinking water wells on the entire 270-acre property on which the Site is located. However, under the assumption that present day concentrations of on-Site groundwater contaminants could migrate to potable supply wells installed in the future on the 270-acre property, EPA assessed if there could be a risk to human consumption of groundwater. Exceedances (i.e., a risk to human health) of U.S. EPA's target risk range and hazard index were calculated due to the presence of 1,3,5-trimethylbenzene, benzene, cis-1,2-dichloroethene, n-butylbenzene, n-propylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, naphthalene, pentachlorophenol, arsenic, and manganese.

Based on Site-specific toxicity testing, modeled exposures, and comparison to reference concentrations, and considering all uncertainties, the ecological risk assessment conducted as part of the RI concluded that there is no significant ecological risk to organisms within Rockwood Brook surface water, sediment, and wetland soil.

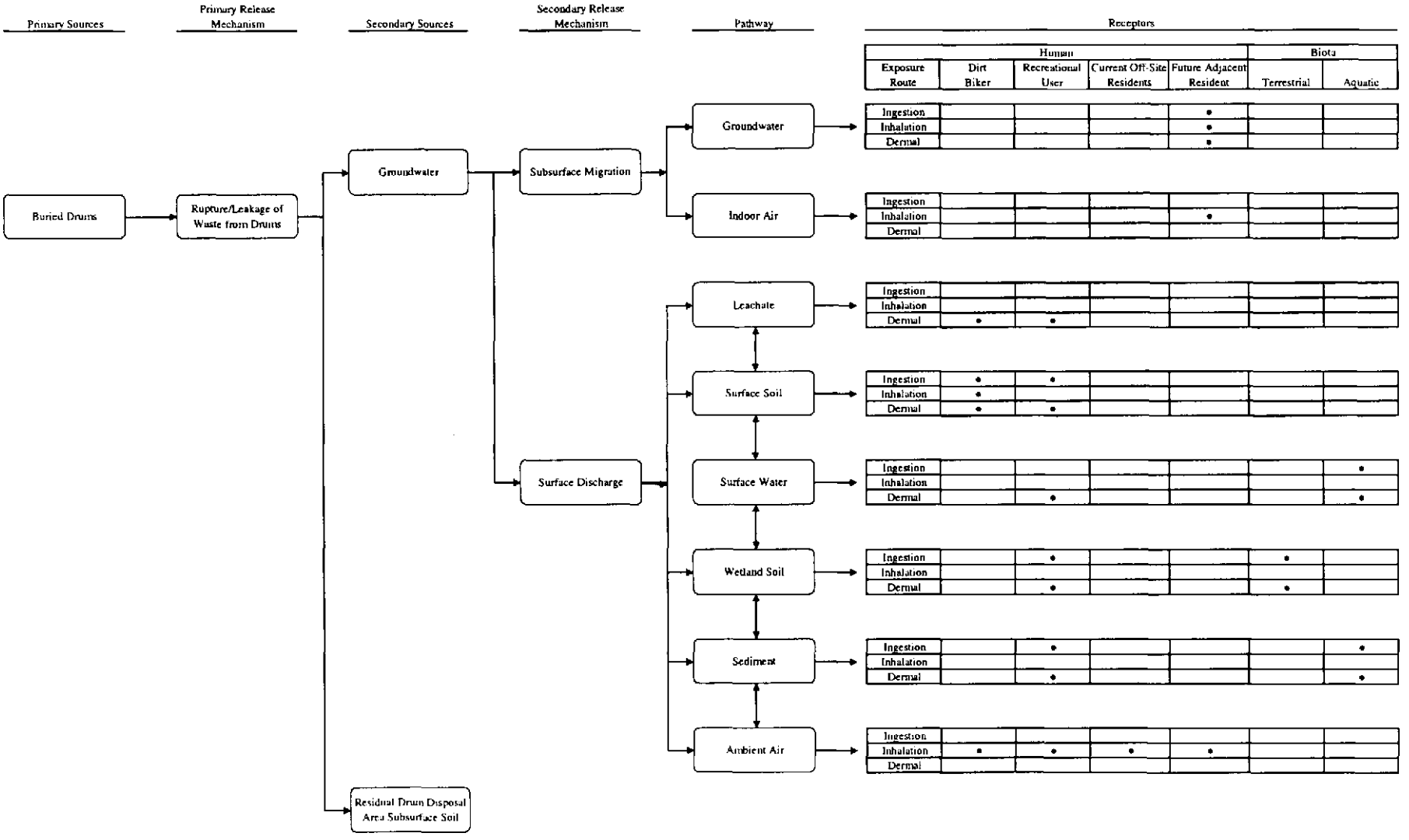
1. Conceptual Site Model

The sources of contamination, release mechanisms, exposure pathways to receptors for the Site, as well as other Site-specific factors, are diagrammed in a Conceptual Site Model (CSM), which is provided below. The CSM is a three-dimensional "picture" of Site conditions that illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors. It documents current and potential future Site conditions and shows what is known about human and environmental exposure through contaminant release and migration to potential receptors. The risk assessment and response action for the Site is based on this CSM.

The sources of contamination for the Site were primarily the drummed wastes disposed of in the two-acre former drum disposal area. The wastes that were contained in the drums were generated from vinyl casting, vinyl laminating, and foam rubber processes that were used at the Troy Mills, Inc. manufacturing facility to produce synthetic fabric products. Contaminants disposed of include vinyl chloride polymers; plasticizers (primarily bis[2-ethylhexyl]phthalate, butylbenzyl phthalate, and di-n-octyl phthalate); and solvents including methyl ethyl ketone (MEK), toluene, acetone, Solvesso 100™ (primarily C_9-C_{10} dialkyl and trialkyl benzenes), Varsol™ (mineral spirits or Stoddard solvent), and Chlorothene™ (primarily 1,1,1-trichloroethane).

Potential migration pathways in Site groundwater include transport through the unsaturated zone, by percolation through wastes and contaminated soil, and in the saturated zone by natural groundwater flow. Transport in surface water can occur during storm events by overland flow of surface water after contact with contaminated soils and wastes and suspension of contaminated soils. Once the overland flow waters reach the flowing surface water bodies, contaminated surface water and suspended sediment can migrate further downstream. Contaminated groundwater can also seep into flowing surface water and be transported downstream.

CONCEPTUAL SITE MODEL FOR TROY MILLS LANDFILL SUPERFUND SITE



2. Site Overview

Section A of this ROD previously described the Troy Mills Landfill Site. Attached Figure 1-1 taken from the RI Report depicts the area in the vicinity of the Site.

The Site is located in an area outside of the 100-year floodplain of Rockwood Brook. Surface soil in the vicinity of the Site is typically dark grayish brown loamy sand about six inches thick. The subsurface layer is grayish brown sand about two inches thick, and the subsoil is about 11 inches thick. The subsoil is very dusky red and dark reddish brown sand in the upper part and yellowish brown sand in the lower part. The substratum extends to a depth of 60 inches or more. It is brownish yellow sand in the upper part and light yellowish brown coarse sand in the lower part. Permeability of the loamy soil is rapid above the substratum and very rapid in the substratum. The depth to bedrock is generally more than 60 inches. The seasonal high water table is at a depth of generally more than six feet below ground surface (bgs). Within the two-acre Site, most of the upper six feet has been excavated and replace in part with clean sand from a nearby sand quarry.

The area within one-half mile of the Site is primarily forested and residential. Wetlands are located downgradient from the former drum disposal area. Active sand and gravel operations are located within 1,000 feet of the Troy Mills Landfill Site to the north, northwest, and southwest. Based on recent aerial photographs, an area of agricultural land is located approximately 700 feet northeast of the Site. The nearest residences are approximately ½ mile from the Site.

A low-yield stratified drift aquifer with a transmissivity below 1,000 square feet per day (ft^2/day) underlies the valley of Rockwood Brook and extends east of the brook and beneath the Site. The numerous borings that have been drilled at the Site indicate that the stratified deposits are largely unsaturated to the east of the access road and below the former drum disposal area. On the west side of the access road, the saturated stratified drift is only about 15 feet thick, and most of the saturated overburden is dense, poorly permeable till. No public water supply sources are located within the low-yield aquifer along Rockwood Brook. The closest public water supply well to the Site is at the Meadowood Assembly Hall, located almost a mile east and upgradient of the Site. Since this well is considered a "transient" supply, no wellhead protection area is associated with it.

Site Geology

The Site is situated on the eastern slope of the Rockwood Brook stream valley. Like the ground surface, the bedrock surface beneath the Site slopes downward from east to west toward Rockwood Brook. As a result, the unconsolidated deposits that underlie the Site are thinner in the east part of the Site than the west. Bedrock outcrops are visible at several locations near the eastern edge of the Site.

Bedrock underlying the Site is comprised of biotite schist of the Littleton Formation. The biotite schist at the Site is typically dark gray, hard, folded, with high angle foliation and fractures, and quartz veins. Seams of granite, quartz, and pegmatite are also present within the schist. Bedrock fractures were found trending both northeast and northwest.

The overburden primarily consists of a sand unit, ablation till, and lodgement till. The sand layer is typically less than six feet in thickness where it remains in place and is mostly saturated in the low area west of the access road. The ablation till is at its thickest beneath the southwestern part of the former drum disposal area, where it is up to 40 feet thick. This unit gradually thins toward Rockwood Brook, where it is less than ten feet thick, and is very thin to absent near the eastern edge of the former drum disposal area where the bedrock is shallow. The lodgement till is thickest at the bottom of the valley floor near Rockwood Brook, where boring logs indicate a thickness of greater than 35 feet. This till unit thins eastward toward the eastern edge of the former drum disposal area.

Attached Figure-3-3 through 3-5 taken from the RI Report shows two geologic cross-sections through the Site. More detailed information is available in Section 3 of the RI Report.

Site Hydrology

Attached Figure 3-6 taken from the RI Report is a water table contour map for the Site, based on water level measurements made on December 17, 2004. The depth to groundwater at the Site is relatively shallow ranging from 3 feet to 20 feet below ground surface. Groundwater flow in the shallow overburden is to the west or northwest, toward Rockwood Brook. The hydraulic gradient is quite steep to the east of the access road, reflecting the low permeability of the till deposits in which the water table occurs. The gradient decreases somewhat to the west of the access road, probably reflecting the higher permeability of the stratified drift deposits and the loss of some water to a seep along the access road and to evapotranspiration in the adjacent wetland. The available data also suggests that the direction of flow in the deeper part of the aquifer is similar to that in the shallow overburden. In general, vertical gradients are downward or neutral except in areas where groundwater is rising to discharge into a stream or wetland. More detailed information is available in Section 3 of the RI Report.

3. Remedial Investigation Sampling Strategy

As noted previously, a significant amount of Site investigation and sampling data was available for review prior to the RI. This included Site investigation activities conducted since 1982 by Troy Mills, Inc., and sampling data collected by EPA during the drum removal action and NPL-listing investigation activities. These data were evaluated for "data gaps" (i.e., missing pertinent information) and used to guide the scope of work for the RI.

A Site reconnaissance to develop a scope of work for the RI was conducted in September 2004. This was followed by a second Site visit in early October 2004. Based on the results of

EPA's review of available data and the Site visits, five new monitoring wells (MW600 series) were installed during the first week of December 2004. The five new monitoring wells were installed at three locations in the vicinity of the former drum disposal area excavation. Monitoring well couplets MW601 and MW602 were installed inside the excavation area footprint, and MW603 was installed at an upgradient location. The monitoring well locations are shown on attached Figure 2-2 taken from the RI Report.

Sampling activities at the Troy Mills Landfill Site were conducted in four separate sampling events that took place in December 2004 and January 2005: surface water/sediment/wetland soil sampling (December 14 through 16, 2004), groundwater sampling (December 19 through 22, 2004), ambient air sampling (January 11, 2005), and soil boring sampling (January 18 through 27, 2005). Attached Figure 2-3 taken from the RI Report depicts these environmental sampling locations.

Environmental samples were collected from December 2004 through January 2005 for the following media:

- Wetland soil
- Surface Water
- Sediment
- Groundwater
- Ambient Air
- Subsurface Soil

Attached Figure 2-3 taken from the RI Report shows the 2001-2005 historical sampling locations within the Troy Mills Landfill Site study area including the groundwater, surface water, sediment, soil borings, wetland soil, and ambient air locations. A more detailed description of the sampling and analysis conducted for the RI can be found in Section 2 of the RI Report.

Wetland Soil Sampling and Analysis

Nine wetland soil samples were collected on December 14 and 15, 2004 and submitted for chemical and toxicity analyses. Six wetland soil samples (including one field duplicate) were collected from the Rockwood Brook Wetland Study Area in order to evaluate human health and ecological risk due to suspected Site-related contaminants in this area. Three reference wetland soil samples were collected upgradient from the Site to provide background concentrations for the risk assessments. All wetland soil samples were submitted for VOC, SVOC, metals, total organic carbon (TOC), and pH analyses. In addition, three wetland soil samples from the Rockwood Brook Wetland Study Area and one wetland soil sample from the reference area were submitted for earthworm toxicity analysis. All wetland soil samples were collected from a depth of 0 - 6 inches. The locations of the wetland soil samples are presented in attached Figure 2-4 taken from the RI Report.

Surface Water Sampling and Analysis

Twelve surface water samples were collected on December 14, 15, and 16, 2004 and submitted for chemical analyses. Based on a field reconnaissance, and for improved statistical purposes (having multiple samples from one area rather than single samples from unrelated areas), sample collection locations were altered from those originally proposed in the sampling and analysis plan (SAP). Six surface water samples (including one field duplicate) were collected from the west branch of Rockwood Brook in the areas adjacent to and downstream of the Site in order to evaluate human health and ecological risk due to migration of suspected Site-related contaminants. Three reference surface water samples were collected from the west branch of Rockwood Brook upstream of the Site to provide background concentrations for the risk assessments. Three surface water samples (including one field duplicate) were collected from the stream adjacent to the recreation trail along the abandoned railroad bed in order to assess the risk to human health. The surface water samples collected from Rockwood Brook were submitted for VOC, SVOC, total metals, dissolved metals, and alkalinity analyses. The surface water samples collected from the stream adjacent to the recreation trail along the abandoned railroad were submitted for VOC, SVOC, and total metals analyses. The locations of the surface water samples are presented in attached Figure 2-5 taken from the RI Report.

Sediment Sampling and Analysis

A total of nine sediment samples were collected on December 15 and 16, 2004 and submitted for chemical and toxicity analysis. Based on a field reconnaissance, and for improved statistical purposes (having multiple samples from one area rather than single samples from unrelated areas), sample collection locations were altered from those originally proposed in the SAP. Six sediment samples (including one field duplicate) were collected from the west branch of Rockwood Brook in the areas adjacent to and downstream of the Site to evaluate human health and ecological risk due to migration of suspected Site-related contaminants. Three reference sediment samples were collected from the west branch of Rockwood Brook upstream of the Site to provide background concentrations for the risk assessments. All sediment samples were submitted for VOC, SVOC, metals, acid volatile sulfide/simultaneously extracted metals (AVS/SEM), TOC, and pH analyses. In addition, five sediment samples from the areas of Rockwood Brook adjacent to and downstream of the Site, and one sediment sample from the reference area, were submitted for amphipod and midge larvae toxicity analysis. All sediment samples were collected from a depth of 0 - 6 inches. The locations of the sediment samples are presented on attached Figure 2-5 taken from the RI Report.

Groundwater Sampling and Analysis

A total of 19 on-Site groundwater monitoring wells were sampled on December 19 through 22, 2004. The groundwater sampling was conducted in order to evaluate the nature and extent of contamination, to determine if 1,4-dioxane is present, and to evaluate whether intrinsic bioremediation is occurring. The groundwater samples from all 19 wells were submitted for

VOCs, SVOCs, and total metals analyses. Groundwater samples from a subset of eight wells were submitted for 1,4-dioxane analysis. The eight wells selected for the 1,4-dioxane analysis represent the wells with the highest historical concentrations of Site contaminants and those at the leading edge of the contaminant plume. Groundwater samples from a separate subset of eight wells were submitted for the following intrinsic bioremediation indicator analyses: chloride/ nitrate/nitrite/sulfate, ammonia, TOC, methane/ethane/ethene/carbon dioxide, and volatile fatty acids (VFAs). Wells selected for intrinsic bioremediation analyses were chosen based on historical data and guidance for monitoring for natural attenuation of contamination in groundwater. Temperature, specific conductance, dissolved oxygen (DO), pH, turbidity, and oxygen reduction potential (ORP) were field-measured at each well during stabilization. The locations of the wells sampled are presented on attached Figure 2-2 taken from the RI Report.

Ambient Air Sampling and Analysis

Five ambient air samples were collected on January 11, 2005 and submitted for VOCs analysis in order to evaluate risk to human health. In order to select air sampling locations, a photo-ionization detector (PID) survey of the drum excavation perimeter was performed. The PID readings were taken at approximately 100-foot intervals along the entire perimeter of the former drum disposal area excavation. The results of the PID survey indicated no VOC concentrations above background. Therefore, a location was chosen on the southern side of the drum excavation perimeter, in an area downwind of the upper drum excavation area. A field duplicate was also collected at this location. Two additional locations were selected based on the likelihood of contact with the public: one ambient air sample was collected along the recreation trail and one ambient air sample was collected along the dirt road in the leachate discharge area. In addition, one ambient air sample was collected north and upwind of the drum excavation area in order to provide background concentrations. All ambient air samples were collected over an 8-hour period. The locations of the ambient air samples are presented on attached Figure 2-6 taken from the RI Report.

Soil Boring Sampling and Analysis

Twelve soil borings were advanced between January 20 and 27, 2005. All soil borings were advanced around the perimeter of the drum excavation area in order to evaluate whether the horizontal extent of the excavation was sufficient to remove soil that may be contaminated. Soil boring locations were staked at approximately 100-foot intervals around the excavation perimeter. Soil boring samples were collected from two intervals at each soil boring location: the interval above groundwater and the interval with the greatest evidence of contamination. All soil boring samples were submitted for VOCs, SVOCs, and metals analyses. The soil boring locations are depicted on attached Figure 2-1 taken from the RI Report.

4. Nature and Extent of Contamination

Wetland Soil

Ten VOCs, nine SVOCs, and 24 metals were detected at least once in the five wetland soil samples collected in the adjacent Rockwood Brook Wetland Study Area downgradient from the former drum disposal area. Bis(2-ethylhexyl)phthalate (BEHP) and beryllium were detected in all five samples collected.

Manganese concentrations reported for all five samples are above the concentrations reported for the three reference samples. The concentration reported for WESO-1 (83,000 mg/kg) was more than two orders of magnitude above the highest concentration detected for the reference samples, and one to two orders of magnitude above the levels found in the other four wetland soil samples. Attached Figure 4-1 taken from the RI Report depicts the distribution of wetland soil concentrations.

The Rockwood Brook Wetland Study Area is a discharge point for both groundwater and leachate coming from the former drum disposal area.

Subsurface Soil

Of the samples collected from the perimeter of the former drum disposal area excavation, BEHP was detected in most samples and was the primary SVOC detected. The locations with the highest total detections of VOCs and SVOCs are on the northern and western edges of the former drum disposal area. Attached Figure 4-2 taken from the RI Report depicts the distribution of subsurface soil concentrations.

Backfilled Soils in the Former Drum Disposal Area

As part of the EPA drum removal action performed during 2004, excavated soils were screened with soils exceeding screening levels segregated and disposed of off-Site and the remaining soils returned to the excavation as backfill. The backfilled soils were later sampled by the EPA to characterize soils remaining in the excavation area. Sixty-four soil samples were collected from 32 borings in the excavation area. At each boring, one sample was collected above the water table and one was collected from the midpoint of the original excavation depth. Additional information on the locations and analytical results from the removal action soil boring sampling is available in Appendix G of the RI Report.

Five samples showed detections above State soil screening standards for at least one of the following analytes: 1,2,4-trimethylbenzene, 2-butanone, and pentachlorophenol. These detections were all in the area considered the "Upper Drum Area."

In the spring of 2005, EPA performed further removal of soils in the area of the Upper Drum Area surrounding the samples noted above. The excavated soils were disposed of off-Site. To characterize soils left in place in the Upper Drum Area following further soil removal, additional samples were collected for laboratory analysis. No detections were noted from toxicity characteristic leaching procedure (TCLP) analysis. Analysis of samples of remaining backfilled soils found no concentrations of VOC, SVOCs, or metals above NHDES soil screening criteria for either leaching or direct contact levels.

LNAPL/leachate

As part of its removal action, EPA constructed a series of three interceptor trenches in 2003 to limit the migration of LNAPL originating from the former drum disposal area. As groundwater and LNAPL seeps into the trenches, the LNAPL is captured in the trench and removed periodically while groundwater (herein called "leachate" in this area) is allowed to seep out of or beneath the trenches. One sample was collected in 2004 from the leachate seep that emerges from the trenches. Water from this leachate seep forms a small rivulet that passes beneath the access road in a culvert and flows into the adjacent wetland (i.e., the Rockwood Brook Wetland Study Area). Other samples were collected from the same area, but were taken prior to the trench installation. The only detections in the 2004 leachate sample were cis-1,2-dichloroethene, BEHP, iron, and manganese.

A nearby shallow groundwater well (MW201S) is considered representative of groundwater entering the interceptor trenches. Cis-1,2-dichloroethene and BEHP, detected in the 2004 leachate sample discussed above, were found in the nearby well at concentrations above groundwater maximum contaminant levels (MCLs). Free product is typically observed in this nearby well. The higher dissolved contaminant concentrations in the well compared to the lower concentrations in the leachate seep suggest that the interceptor trenches are limiting migration of the LNAPL, as designed.

The presence and/or absence of LNAPL was gauged in the 35 on-Site monitoring wells for which water level measurements were conducted as part the RI groundwater sampling event. These measurements indicated that LNAPL was present at a measurable thickness in wells MW201S and MW201P.

Surface Water in Recreation Trail

The former railroad bed passing to the east of the Site is currently used as a recreation trail. Two standing water samples were collected from the ditch next to the trail for evaluation in the human health risk assessment. Although the samples were collected as if they were surface water samples, the water in the ditch is believed to be groundwater that has seeped into the ditch and formed puddles that are not actually connected to any surface water body. The water samples collected along the recreation trail were southeast and northeast of the two upgradient wells (MW107 and MW603) at the Site. Data indicate that there is a groundwater divide between the

Site and the recreation trail. The water along the recreation trail could, therefore, include seepage of groundwater that originates from a limited area just west of the trail; however, it is separated from the contaminated groundwater beneath the Site by the divide.

Of the VOCs analyzed, only carbon disulfide was detected. There were 12 SVOCs detected at low concentrations, eleven of which were PAHs. Variety metals were detected in the water and are similar in concentrations to background groundwater. The PAHs and arsenic detected in the water are likely associated with historical railroad operations (e.g., leaching from railroad ties). There was no indication of a connection with contaminants found at the Site. Attached Figure 4-3 taken from the RI Report depicts the distribution of surface water soil concentrations.

Ambient Air

Four ambient air samples were collected at the Site: one on the edge of the former drum disposal area; one on the access road near the LNAPL interceptor trenches; one due east of the former drum disposal area near the former railroad bed; and one on the solid waste landfill north of the former drum disposal area. Twelve VOCs were detected in at least one sample, but none were above NHDES ambient air screening levels. Maximum detections were found in the samples east and west of the former drum disposal area. Trimethylbenzenes, chloromethane, dichlorofluoromethane, trichlorofluoromethane, benzene, toluene, and acetone were detected in multiple samples, but not at concentrations that exceed any air standards.

Sediment

Five sediment samples were collected from Rockwood Brook in an area hydraulically downgradient from the former drum disposal area, and three sediment samples were collected from upstream (reference) locations on the west branch of the brook. For the non-reference sediment samples collected in Rockwood Brook, five VOCs were detected at low concentrations. Acetone was detected in all five samples, while the following analytes were each detected in one sample: 1,1-dichloroethane, 2-butanone, 4-isopropyltoluene, and styrene. Of the nine SVOCs detected, the primary contaminants are phthalates, with a few PAHs, 2-methylphenol, and benzaldehyde also found in the samples. The highest concentrations were found at the most downgradient location, RBSE-1. The same metals detected in the reference locations were detected in non-reference samples. A comparison of average concentrations shows the non-reference concentrations to be higher than the reference concentrations. Attached Figure 4-4 taken from the RI Report depicts the distribution of sediment concentrations.

Surface Water

Five surface water samples were collected from Rockwood Brook in an area hydraulically downgradient from the former drum disposal area, and three surface water samples were collected from upstream (reference) locations on the west branch of the brook. For the non-

reference surface water samples collected in Rockwood Brook, only one VOC, carbon disulfide, was detected in one sample. Seven SVOCs were detected, six of which were PAHs and the remaining contaminant being 2,4,6-trichlorophenol. The 2,4,6-trichlorophenol detection occurred at the most downgradient location, but was of lower magnitude than the reference location detections. Five of the six PAHs were detected at RBSW-2, and three were detected at concentrations above federal ambient water quality criteria (AWQCs): benzo(a)anthracene, benzo(a)pyrene, and chrysene. The corresponding sediment sample at this location did not show detections of these analytes. Nearby groundwater in monitoring wells M3, M6, and M7 did not have detections of these analytes. However, monitoring wells MW104S and MW104D, which are a little further upgradient in the Rockwood Brook Wetland Study Area, did have detections of these analytes.

Metals detected were similar in magnitude to those found in the reference locations except for a few exceedances of AWQCs (arsenic, manganese, and mercury). The mercury was only detected in a single filtered sample, while mercury in the corresponding unfiltered sample was undetected. Attached Figure 4-3 taken from the RI Report depicts the distribution of surface water concentrations.

Groundwater

Samples were collected from 18 monitoring wells in the vicinity of and downgradient of the former drum disposal area. Positive results were reported in at least one well for a total of 32 VOCs and 28 SVOCs. The VOCs detected included alkylbenzenes, BTEX (benzene, toluene, ethylbenzene, and xylenes), and chlorinated solvents and related compounds. The SVOCs detected include PAHs, phenols, and phthalates. All metals analyzed were detected in at least one location with the exception of beryllium, mercury, silver, and thallium which were not detected. Attached Figures 4-5 through 4-13 taken from the RI Report depicts the distribution of groundwater concentrations.

Aromatic VOCs/PAHs. With the exception of one result, concentrations that exceeded MCLs or NHDES Ambient Groundwater Quality Standards (AGQS) for trimethylbenzenes, toluene, and naphthalene were collected from the north and northeast portions of the former drum disposal area. Results for these compounds were lower, but of the same order of magnitude, than samples located further downgradient. Concentrations of total alkylbenzenes (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-butylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene), naphthalene, and BTEX generally parallel this distribution.

Chlorinated VOCs and 1,4-Dioxane. Exceedances for the chlorinated VOCs (1,1-dichloroethene, cis-1,2-dichloroethene, and trichloroethene) and the related compound 1,4-dioxane were not as tightly clustered by well locations. Of these compounds, detections were most prevalent and concentrations greatest for cis-1,2-dichloroethene (cis-1,2-DCE).

In all cases, concentrations of trichloroethene (TCE) reported were less than the concentration of 1,2-DCE reported for the same location. The TCE was detected in 10 of 18 wells sampled, but exceeded standards in only one well. Concentrations of 1,1-dichloroethene (1,1-DCE) were detected in eight wells, but only exceeded the standard in one well . The concentration for 1,4-dioxane was above the state drinking water guideline in one location, but was detected in five additional wells for a total of six out of the eight wells sampled for 1,4-dioxane analysis. There is currently no MCL or NH AGQS for 1,4-dioxane.

Pentachlorophenol, Tetrahydrofuran, and Bis(2-ethylhexyl)phthalate. Pentachlorophenol was detected in ten locations sampled with concentrations above MCLs at two locations. Tetrahydrofuran was detected in eleven locations with concentrations above the NH AGQS standard in four locations. There is currently no MCL for tetrahydrofuran. BEHP was detected in samples from four of the wells sampled, and three of the results exceeded MCLs.

Metals. Manganese was detected in all of the wells sampled, and 10 of the results were above the NH AGQS standard. There is currently no MCL for manganese.

Natural Attenuation/Geochemical Parameters. Based on the results presented in the RI Report, it can be concluded that natural degradation of certain Site groundwater contaminants has occurred.

Trends in historical data and modeling suggest that selected aromatic VOCs have generally decreased in concentration over time, and that this is due in part to natural degradation. Whether a particular aromatic VOC will degrade under aerobic or anaerobic conditions is highly dependent on chemical structure. For example, while it is known with certainty that toluene will degrade under aerobic and anaerobic conditions, monoaromatic compounds with alkyl substituents longer than an ethyl group (e.g., diethylbenzene, methylpropylbenzene, and n-butyl-benzene) have been shown in one study to be highly recalcitrant under anaerobic conditions.

Trends in historical data do not present as clear a picture for the chlorinated ethenes, however the presence of the *cis* isomer of 1,2-DCE lends support to the supposition that tetrachloroethene or TCE have degraded, since *cis* is not the predominant isomer in 1,2-DCE solvents. In addition, modeling suggests that both TCE and *cis*-1,2-DCE follow first-order decay within the wells modeled.

5. Potential Routes of Migration

Groundwater

Potential migration pathways in Site groundwater include transport through the unsaturated zone by percolation through wastes and contaminated soil, and transport in the saturated zone by natural groundwater flow.

Most areas of concern within the Site are not covered with low permeability soils. Therefore, precipitation will percolate vertically through these areas. Within the unsaturated zone, when percolating water comes into contact with waste materials and contaminated soils, many of the chemicals will dissolve and migrate with the water as a dissolved phase through the unsaturated zone and possibly reach the saturated zone.

Within the saturated zone, dissolved chemicals will migrate in the direction of groundwater flow. Biodegradation, hydrolysis, oxidation, reduction, and ion exchange also occur in the saturated zone. However, due in part to lower oxygen and nutrient levels in the saturated zone, conditions are not always adequate to make these processes significant attenuation mechanisms. Adsorption is often the dominant attenuation mechanism in the saturated zone. While biodegradation of most organic contaminants appears to be occurring at the Troy Mills Landfill Site, attenuation of remaining contaminants is likely influenced primarily by adsorption.

Surface Water

Generally, inputs to surface water within the Site consists of groundwater discharge, overland flow/runoff, and direct rainfall. Different surface water locations within the Site exhibited elevated concentrations of some PAHs and metals. Within most of the Site, groundwater discharges to surface water and, in the process, contributes contaminants to surface water. However, adsorption to sediments before they reach surface water likely prevents many contaminants from being released to surface waters. Once the contaminants are in the surface water, a variety of mechanisms occur that tend to reduce concentrations, including dilution, volatilization, photolysis, hydrolysis, oxidation, reduction, and biodegradation. The more strongly adsorbed compounds such as SVOCs may not be detected in surface water unless suspended solids are high such as would be the case after a storm event.

Overland flow/runoff at the Site will drain to the west and northwest, carrying with it dissolved contaminants and eroded sediments. Runoff is a potential source of contaminants in Rockwood Brook and associated wetlands.

Transport in surface water can also occur during storm events by overland flow of surface water after contact with contaminated soils and wastes and suspension of contaminated soils. Once the overland flow waters reach the flowing surface water bodies, contaminated surface water and suspended sediment can migrate further downstream.

Sediment

Sediment transport occurs through overland flow/runoff, and scouring and resuspension in flowing surface water bodies. Within the Site, primary transport pathways include overland flow/runoff from the areas of concern and resuspension in Rockwood Brook. It should be noted that modifications to surface drainage features at the Site were implemented during the summer of 2005 to reduce runoff erosion. Phthalates are prevalent throughout most of the Site. Since

most sediments at the Site are inherently high in organic matter, these contaminants have the potential to strongly adsorb to sediments in Rockwood Brook.

Surface water velocities are moderate within the Site. Therefore, scouring and resuspension of sediments can be expected, with even more occurring during storm events or during spring snow melt.

Air

Volatilization of VOCs from groundwater may migrate and impact ambient air at the Site. In addition, air may transport contaminated dust from the former drum disposal area if the existing permeable soil cap is not maintained and the underlying residual soils become exposed.

6. Routes of Exposure

Several potential routes of human exposure were considered in the baseline human health risk assessment conducted as part of the RI. The following summarizes the pathways evaluated for each human health exposure scenario:

- Current adolescent/adult and future young child/adult recreational user along access road:
  - Dermal contact with surface soil and leachate;
  - Ingestion of surface soil; and
  - Inhalation of soil-derived particulates and volatiles in ambient air.

- Current adolescent/adult and future young child/adult recreational user in Rockwood Brook Wetland Study Area:
  - Dermal contact with surface water and wetland soil;
  - Ingestion of wetland soil; and
  - Inhalation of volatiles in ambient air.

- Current adolescent/adult and future young child/adult recreational user in Rockwood Brook:
  - Dermal contact with surface water and sediment;
  - Ingestion of sediment; and
  - Inhalation of volatiles in ambient air.

- Current adolescent/adult and future young child/adult recreational user in Sand Dam Pond:
  - Ingestion of sediment; and
  - Dermal contact with surface water and sediment.

- Current /future young child and adult recreational swimmer at Sand Dam Pond Beach:
  - Ingestion of surface water; and
  - Dermal contact with surface water and sediment.

- Current adolescent/adult and future young child/adult recreational user along the recreation trail (former railroad bed):
  - Dermal contact with surface water; and
  - Inhalation of volatiles in ambient air.

- Current nearby off-Site young child/adult resident:
  - Inhalation of volatiles in ambient air.

- Future adjacent young child/adult resident:
  - Ingestion of groundwater as drinking water;
  - Dermal contact with groundwater while showering/bathing;
  - Inhalation of volatiles in ambient air, indoor air, and while showering.

Several potential routes of human exposure were considered in the baseline ecological risk assessment conducted as part of the RI. The following summarizes the pathways evaluated for each ecological exposure scenario:

- Uptake of chemicals from sediment, surface water, shallow groundwater, and wetland soil through roots (vegetation)

- Dermal exposure to chemicals in wetland soil (burrowing invertebrates, mammals, and amphibians)

- Ingestion of chemicals bound to wetland soil (terrestrial invertebrates, birds, mammals, amphibians)

- Ingestion of chemicals bound to sediment (benthic invertebrates, aquatic and semi-aquatic birds, mammals, amphibians)

- Ingestion of dissolved chemicals (benthic invertebrates, fish, amphibians, aquatic and semi-aquatic birds and mammals)

- Ingestion of chemicals through consumption of contaminated plants (herbivores, omnivores)

- Ingestion of chemicals through consumption of contaminated prey (all predators)

Human health and ecological risks associated with these pathways are presented later in this document.

7. Principal and Low-Level Threats

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Wastes generally considered to be principal threats are liquid, mobile and/or highly-toxic source material.

Low-level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that generally considered to be low-level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing chemicals of concern that are relatively immobile in air or groundwater, low leachability contaminants or low toxicity source material.

The principal and low-level threats that this ROD addresses are summarized in the following table:

Table E-1

Principal and Low-Level Threats

Principal Threats				
Affected Media	**Contaminant(s)**	**Reason(s)**	**Maximum Concentration(s)**	**Receptors**
LNAPL-contaminated leachate	bis-2-ethylhexyl phthalate (BEHP)	Toxicity	32,000 ppb	Future recreational users
Low Level Threats				
Affected Media	**Contaminant(s)**	**Reason(s)**	**Concentration(s)**	**Receptors**
Groundwater	Aromatic VOCs, chlorinated VOCs, manganese	Mobility, Toxicity	5,500 ppb (toluene), 340 ppb (cis-1,2-DCE), 6,500 ppb (manganese),	Future near-Site residents
Wetland soil	Manganese	Low toxicity, non-mobile	83,000 ppm	Future recreational users
Subsurface soil in former drum disposal area	SVOCs	non-mobile	630,000 ppb (BEHP)	Future recreational users

ppb = parts per billion.
ppm = parts per million.

F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

1. Land Uses

The Troy Mills Landfill Site is undeveloped and is surrounded primarily by undeveloped woodlands, a gravel access road to the west, and a former railroad bed currently used as a recreational trail to the east. The area within one-half mile of the Site is primarily forested and residential. Wetlands are located downgradient from the former drum disposal area. Active sand and gravel operations are located within 1,000 feet of the Troy Mills Landfill Site to the north, northwest, and southwest. Based on recent aerial photographs, an area of agricultural land is located approximately 700 feet northeast of the Site.

The town center is approximately 1.5 miles north of the Troy Mills Landfill Site. The town center includes a mix of commercial, municipal and residential uses. The nearest residences are located on South Street, which parallels the eastern boundary of the Site about a ½ mile distant. Further to the east is the village of Bowkerville. An estimated 3,886 people reside within four miles of the Site. Sand Dam Pond, a recreational area located approximately one mile north of the Site, receives surface water discharges from Rockwood Brook which flows from the former drum disposal area.

Currently the property is owned by Troy Mills, Inc. and is controlled by the Troy Mills bankruptcy trustee while the company is undergoing bankruptcy proceeding. The Town has expressed a potential interest in acquiring the property for passive recreation. EPA and NHDES have held meetings with town officials to discuss environmental issues pertaining to both the Troy Mills Landfill Site and the adjacent solid waste landfill should they acquire and reuse the property.

The 270-acre property and the immediately surrounding parcels are zoned "rural district". Allowable uses include: one and two-family dwellings, agricultural uses, stables and riding academies, plant nurseries and greenhouses, veterinary hospitals, family daycare, and sand and gravel operations. Other allowable uses subject to a special permit are: conversion apartments, accessory apartments, family group day care, and group childcare centers.

As a practical matter, residential and other uses that require the construction of buildings and other significant structures within the two-acre Troy Mills Landfill Site would be limited due to the institutional controls that will be placed on the Site to protect the remedy. For the adjacent solid waste landfill, state regulations would affect the cost and viability of future reuse options within that area.

Town officials have expressed an interest in using the property for passive recreation that might include creating trails that would link up with nearby existing recreational trails. Other than the need to protect the permeable soil cap over the former drum disposal area, monitoring

wells, and other cleanup-related structures from vandalism or incidental damage, passive recreation could be compatible with the Site and consistent with surrounding land uses.

EPA's remedial actions on the Troy Mills Landfill Site do not preclude the possibility that other portions of the property could be used for residential development despite challenges posed by the steep terrain, limited road access, and lack of public utilities. Commercial uses, with very limited exceptions, and industrial uses are not allowed under the current zoning and were not considered a reasonably-anticipated future land use.

Reasonably-anticipated future uses of the Site include passive and active recreational use. Reasonably-anticipated future uses of adjacent land and in surrounding areas include recreational and residential use. The future land use assumptions for the Site and surrounding areas are based on discussions with state and local officials. In July 2005, EPA prepared a Reuse Assessment for the Site that summarizes information on the current and potential future land uses at the Site that is currently known to EPA.

2. Groundwater/Surface Water Uses

The Town of Troy operates a public water supply system that serves the downtown Troy area and vicinity. Public water and sewer extend to residents on South Street for about 1,500 feet south of downtown and about ½ mile northeast of the Site. Troy's public water supply wells and the associated wellhead protection area are several miles north of the Site. A transient water supply well is located at the Meadowood Assembly Hall, about a mile east of the Site. The nearest private drinking water wells are on South Street approximately ½ mile northeast of the Site.

NHDES has prepared a Groundwater Use and Value Determination and has determined that Site groundwater is classified as "medium", based primarily on the low yield of the underlying overburden and bedrock aquifers and the moderate likelihood of future drinking water use in the area. There is no current use of the groundwater at the Site and surrounding areas. The potential future beneficial use of the groundwater at the Site and surrounding areas is for drinking water purposes assuming portions of the 270-acre property in vicinity of the Site are developed for residential use.

The current use of the surface water at the Site and surrounding areas is recreational. Hikers, fishermen, hunters, birders and other similar users potentially access and travel along Rockwood Brook. In addition, Sand Dam Pond, a recreational area located approximately one mile north of the Site, receives surface water discharges from Rockwood Brook. From Rockwood Pond, Rockwood Brook enters the South Branch of the Ashuelot River. The potential beneficial use of the surface water at the Site and surrounding areas is recreational. Rockwood Brook and the Ashuelot River are designated as Class B surface waters by NHDES. The Class B designation indicates surface waters that are "potentially of the second highest quality and are acceptable for swimming and other recreation, fish habitat and for use as a water supply

following adequate treatment." There are no known drinking water intakes within 15 miles downstream of the Site. Evidence of fishing along Rockwood Brook has been documented in the past.

The current and future uses of the land, groundwater, and surface water are summarized in the following table:

Table F-1

Current and Future Uses

	Current On-Site Use	Current Adjacent Use	Reasonable Potential Beneficial Use	Basis for Potential Beneficial Use
Land	Undeveloped woods	Undeveloped woods, sand/gravel mining	Recreational	Zoning, Reuse Assessment
Shallow Groundwater	None	None	Drinking water	Reuse Assessment
Deep Groundwater	None	None	Drinking water	Reuse Assessment
Surface Water	Recreational	Recreational	Recreational	NHDES Class B Designation, Reuse Assessment

G. SUMMARY OF SITE RISKS

A baseline risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The baseline risk assessment followed a four step process: 1) hazard identification, which identified those hazardous substances which, given the specifics of the Site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances, and 4) risk characterization and uncertainty analysis, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the Site, including carcinogenic and non-carcinogenic risks and a discussion of the uncertainty in the risk estimates. A summary of those aspects of the human health risk assessment which support the need for remedial action is discussed below followed by a summary of the environmental risk assessment.

1. Human Health Risk Assessment

A baseline human health risk assessment (HHRA) was completed for the Troy Mills Landfill Site to evaluate the likelihood and magnitude of potential human health effects associated with historical disposal practices. The HHRA evaluated the potential for contaminants in surface water, sediment, and wetland soils in Rockwood Brook and its associated wetland; soil along the access road; groundwater; surface water along the recreational trail; surface water and sediment in Sand Dam Pond; and ambient air to impact human health receptor populations.

Section 1: Identification of Chemicals of Concern

Forty of the more than 90 chemicals detected at the Site were selected for evaluation in the human health risk assessment as chemicals of potential concern. The chemicals of potential concern were selected to represent potential Site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment and can be found in Tables 2.1 through 2.9 of the baseline human health risk assessment. From this, a subset of chemicals were identified in the FS as presenting a significant current or future risk and are referred to as the chemicals of concern (COCs) in this ROD and summarized in Tables G-1 through G-3 for leachate, wetland soil, and groundwater. These tables contain the exposure point concentrations used to evaluate the reasonable maximum exposure (RME) scenario in the baseline risk assessment for the chemicals of concern. Estimates of average or central tendency exposure concentrations for the chemicals of concern and all chemicals of potential concern can be found in Tables 3.1 through 3.9 of the baseline human health risk assessment.

Table G-1

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Leachate
Exposure Medium: Leachate

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Access Road	BEHP	6	32,000	ug/L	6 / 6	22,589	ug/L	95% UCL - N

Key
BEHP: bis(2-ethylhexyl)phthalate
ug/L: micrograms/liter (equivalent to parts per billion)
MAX: Maximum Detected Value
MIN: Minimum Detected Value
95% UCL – N: 95% UCL of Normal Data

The table presents the future chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in leachate (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in leachate). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the Site), the EPC, and how the EPC was derived. This table indicates that bis(2-ethylhexyl)phthalate is the only COC in leachate at the Site. The 95% UCL on the arithmetic mean was used as the EPC for bis(2-ethylhexyl)phthalate.

Table G-2

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Wetland Soil
Exposure Medium: Wetland Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Rockwood Brook Wetland Study Area	Manganese	36.6	83,000	mg/kg	11 / 11	43,952	mg/kg	95% UCL - G

Key
mg/kg: milligrams/kilogram (equivalent to parts per million)
MAX: Maximum Detected Value
MIN: Minimum Detected Value
95% UCL – G: 95% UCL of Gamma Distributed Data

The table presents the future chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in wetland soil (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in wetland soil). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the Site), the EPC, and how the EPC was derived. This table indicates that manganese is the only COC in wetland soil at the Site. The 95% UCL on the arithmetic mean was used as the EPC for manganese.

Table G-3

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Tap Water (Monitoring Wells)	1,3,5-Trimethylbenzne	0.42	370	ug/L	7 / 18	370	ug/L	Max
	1,4-Dioxane	0.63	3.1	ug/L	6 / 8	3.1	ug/L	Max
	2-Butanone	1,900	1,900	ug/L	1 / 18	1,900	ug/L	Max
	4-Isopropylene	0.4	58	ug/L	7 / 18	58	ug/L	Max
	Benzene	0.064	3.4	ug/L	12 / 18	3.4	ug/L	Max
	cis-1,2-Dichloroethene	0.5	340	ug/L	12 / 18	340	ug/L	Max
	n-Butylbenzene	0.9	69	ug/L	7 / 18	69	ug/L	Max
	n-Propylbenzene	3	110	ug/L	8 / 18	110	ug/L	Max
	Tetrachloroethene	0.14	1.2	ug/L	5 / 18	1.2	ug/L	Max
	Tetrahydrofuran	2.2	690	ug/L	11 / 18	690	ug/L	Max
	Toluene	1	5,500	ug/L	6 / 18	5,500	ug/L	Max
	Trichloroethene	0.058	8	ug/L	10 / 18	8	ug/L	Max
	Vinyl Chloride	0.15	1.5	ug/L	8 / 18	1.5	ug/L	Max
	Benzo(a)pyrene	0.015	0.035	ug/L	2 / 18	0.035	ug/L	Max
	Benzo(b) fluoranthene	0.0095	0.06	ug/L	4 / 18	0.06	ug/L	Max
	BEHP	2.5	170	ug/L	4 / 18	170	ug/L	Max
	Dibenzo(a,h) anthracene	0.0095	0.012	ug/L	4 / 18	0.012	ug/L	Max
	Naphthalene	0.023	65	ug/L	8 / 18	65	ug/L	Max
	PCP	0.021	4.76	ug/L	10 / 18	4.76	ug/L	Max
	Arsenic	0.28	8.7	ug/L	15 / 17	8.7	ug/L	Max
	Boron	5.4	2,600	ug/L	16 / 17	2,600	ug/L	Max
	Manganese	61.4	6,500	ug/L	17 / 17	6,500	ug/L	Max

Key
BEHP: bis(2-ethylhexyl)phthalate
PCP: Pentachlorophenol
ug/L: micrograms/liter (equivalent to parts per billion)
MAX: Maximum Detected Value
MIN: Minimum Detected Value

The table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in groundwater (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in groundwater). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the Site), the EPC, and how the EPC was derived. This table indicates that the inorganic chemicals, arsenic and manganese, are the most frequently detected COCs in groundwater at the Site. The maximum detected concentration was used as the EPCs for all COCs detected in groundwater.

1,4-dioxane, 2-butanone, 4-isopropylene, tetrahydrofuran, benzo(b)fluoranthene, and boron were originally screened out as COCs because either their EPCs were below screening levels or there was no available toxicity data (tetrahydrofuran). However, they are included on this table because they are detected in groundwater at levels that exceed the New Hampshire Ambient Groundwater Quality Standards (AGQS). These chemicals were not listed on the remaining tables in Section G of the ROD, as they were screened out originally as COCs; however, EPA has developed interim groundwater cleanup levels (see Table L-1 of the ROD) as they are present in groundwater in exceedances of AGQS.

Section 2: Exposure Assessment

Current and potential future Site-specific pathways for exposure to chemicals of concern were determined. The extent, frequency, and duration of current or future potential exposures were estimated for each pathway. From these exposure parameters, a daily intake level for each Site-related chemical was estimated.

The Site is located approximately 1.5 miles from the center of Troy, along an unpaved gravel access road. Access to the Site is unrestricted and there are no permanent buildings or pavement present. The Site is surrounded by woodlands and is bordered to the north by an intermittent stream, undeveloped woodland, and sparsely developed and heavily wooded residential and commercial properties; to the east by the former railroad bed currently used as a recreation trail and as a snowmobile trail when there is snow present; to the west by the access road, Rockwood Brook and its wetlands; and to the south by the eastern branch of Rockwood Brook. Sand Dam Pond, a recreational pond used for swimming and fishing, is located on Rockwood Brook approximately one mile north and downstream from the Site. Residences in the vicinity of the Site have private potable wells. However, sampling of the most proximate residences, that requested to have their wells tested, on Rockwood Pond Road and South Street, indicate that private well water is not impacted by the Site.

As part of EPA's removal action, excavated soils from the former drum disposal area were screened for volatile contaminants, soils exceeding screening levels were segregated and disposed of off-Site, and the low-level contaminated soils were backfilled into the drum excavation area. However, the risk assessment did not include an evaluation of exposures at the former drum disposal area because of the presumption that at least two feet of clean cover soil would be placed on this area to limit current and future contact with potential residual soil contamination.

The following is a brief summary of the exposure pathways that were found to present a risk at the Site. A more thorough description of all exposure pathways evaluated in the risk assessment including estimates for an average exposure scenario, can be found in Section 3.0 and on Tables 4.1 through 4.14 of the baseline human health risk assessment.

No current exposure pathways were found to present a significant risk at the Site.

The following future exposure pathways were found to present a risk at the Site:

- Recreational user (adult and young child) from exposure to leachate (by dermal contact) along the access road;[1]

[1] For future recreational leachate exposures, exposure durations of 24 years and 6 years, respectively, were presumed for an adult and young child. Body weights of 70 kg and 15 kg were used for the adult and child, respectively. Dermal contact was assumed with 4,500 cm^2 of surface area for the adult and 1,500 cm^2 for the child. Future leachate exposures were assumed to occur 104 days/year.

- Recreational user (adult and young child) from exposure to wetland soil (by ingestion and dermal contact) within the adjacent Rockwood Brook wetlands;[2] and

- Adjacent residential household exposure to untreated groundwater (by ingestion, dermal contact, and inhalation) from a groundwater plume area delineated by Site monitoring wells.[3]

Section 3: Toxicity Assessment

EPA assessed the potential for cancer risks and non-cancer health effects.

The potential for carcinogenic effects is evaluated with chemical specific cancer slope factors (CSFs) and inhalation unit risk values. A weight of evidence classification is available for each chemical. CSFs have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk calculated using the CSFs is unlikely to be greater than the risk predicted. A summary of the cancer toxicity data relevant to the chemicals of concern is presented in Table G-4.

[2] For future recreational wetland soil exposures, ingestion of 100 mg/day for 24 years was presumed for an adult. For a young child (age 1 to 6), ingestion of 200 mg/day for 6 years was presumed. Body weights of 70 kg and 15 kg were used for the adult and child, respectively. Dermal contact was assumed with 5,700 cm^2 of surface area for the adult and 2,800 cm^2 for the child. Future wetland soil exposures were assumed to occur 104 days/year.

[3] For future residential exposures to untreated groundwater, drinking water ingestion rates of 2 L/day and 1.5 L/day for the adult and young child, respectively, were assumed. An exposure frequency of 350 days/year was used for a combined exposure duration of 30 years. Dermal contact was assumed with 18,000 cm^2 of surface area for the adult, and 6,600 cm^2 for the child. Showers/baths were assumed to occur 350 days/year for 0.58 hr/day for the adult and 1 hr/day for the child. Airborne concentrations of volatile compounds released during showering/bathing were estimated using the Foster and Chrostowski shower model.

Table G-4

Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YYYY)
1,3,5-Trimethylbenzene	N/A	N/A	N/A	D	STSC	01/05/05
Benzene	5.5E-02	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/05/05
cis-1,2-Dichloroethene	N/A	N/A	N/A	D	IRIS	01/05/05
n-Butylbenzene	N/A	N/A	N/A	N/A	N/A	N/A
n-Propylbenzene	N/A	N/A	N/A	N/A	N/A	N/A
Tetrachloroethene	5.4E-01	5.4E-01	$(mg/kg\text{-}day)^{-1}$	N/A*	CalEPA	01/05/05
Toluene	N/A	N/A	N/A	D	IRIS	01/05/05
Trichloroethene	4.0E-01	4.0E-01	$(mg/kg\text{-}day)^{-1}$	B1*	NCEA	01/05/05
Vinyl Chloride	7.5E-01	7.5E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/05/05
Benzo(a)pyrene	7.3E+00	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (a)	01/05/05
bis(2-ethylhexyl)phthalate	1.4E-02	1.4E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/05
Dibenzo(a,h)anthracene	7.3E+00	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (a)	01/05/05
Naphthalene	N/A	N/A	N/A	C	IRIS	01/05/05
Pentachlorophenol	1.2E-01	1.2E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/05
Arsenic	1.5E+00	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/05/05
Manganese (drinking water)	N/A	N/A	N/A	D	IRIS	01/05/05
Manganese (other media)	N/A	N/A	N/A	D	IRIS	01/05/05

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YYYY)
1,3,5-Trimethylbenzene	N/A	N/A	N/A	D	STSC	01/05/05
Benzene	7.8E-06	$(ug/m^3)^{-1}$	N/A	A	IRIS	01/05/05
cis-1,2-Dichloroethene	N/A	N/A	N/A	D	IRIS	01/05/05
n-Butylbenzene	N/A	N/A	N/A	N/A	N/A	N/A
n-Propylbenzene	N/A	N/A	N/A	N/A	N/A	N/A
Tetrachloroethene	5.9E-06	$(ug/m^3)^{-1}$	N/A	N/A*	CalEPA	01/05/05
Toluene	N/A	N/A	N/A	D	IRIS	01/05/05
Trichloroethene	1.1E-04	$(ug/m^3)^{-1}$	N/A	B1*	NCEA	01/05/05
Vinyl Chloride	4.4E-06	$(ug/m^3)^{-1}$	N/A	A	IRIS	01/05/05
Naphthalene	N/A	N/A	N/A	C	IRIS	01/05/05

Table G-4

Cancer Toxicity Data Summary

Key	EPA Group
N/A: Not applicable IRIS: Integrated Risk Information System, U.S. EPA NCEA = National Center for Environmental Assessment, U.S. EPA CalEPA = California Environmental Protection Agency STSC = Superfund Technical Support Center (a) Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93-089 (1993). MM/DD/YY = Month/Day/Year	A - Human carcinogen B1 - Probable human carcinogen - Indicates that limited human data are available B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans C - Possible human carcinogen D - Not classifiable as a human carcinogen E - Evidence of noncarcinogenicity N/A – Not available * - Under review by EPA

This table provides the carcinogenic risk information which is relevant to the chemicals of concern in leachate, wetland soil, and groundwater. At this time, slope factors are not available for the dermal route of exposure. Thus, the dermal slope factors used in this assessment have been extrapolated from oral values. An adjustment factor is sometimes applied, and is dependent upon how well the chemical is absorbed via the oral route. Adjustments are particularly important for chemicals with less than 50% absorption via the ingestion route. However, adjustment is not necessary for the chemicals evaluated at this Site. Therefore, the same values presented above were used as the dermal carcinogenic slope factors for these contaminants. Four of the COCs are also considered carcinogenic via the inhalation route. Benzo(a)pyrene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, pentachlorophenol, arsenic, and manganese are non-volatile contaminants and were not included in the evaluation of inhalation exposures.

The potential for non-cancer health effects is quantified by reference doses (RfDs) for oral exposure and reference concentrations (RfCs) for inhalation exposures. RfDs and RfCs have been developed by EPA and they represent an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure that is likely to be without an appreciable risk of deleterious health effects during a lifetime. RfDs and RfCs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A summary of the non-carcinogenic toxicity data relevant to the chemicals of concern at the Site is presented in Table G-5.

Table G-5

Non-Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Dermal RfD	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of Rfd: Target Organ (MM/DD/YY YY)
1,3,5-Trimethylbenzene	Chronic	5.0E-02	mg/kg-day	5.0E-02	mg/kg-day	General Toxicity/ Liver/Kidney	3,000	STSC	01/05/05
Benzene	Chronic	4.0E-03	mg/kg-day	4.0E-03	mg/kg-day	Immune System	300	IRIS	01/05/05
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg-day	1.0E-02	mg/kg-day	Blood	3,000	STSC	01/05/05
n-Butylbenzene	Chronic	2.0E-03	mg/kg-day	2.0E-03	mg/kg-day	Blood	10,000	IRIS	01/05/05
n-Propylbenzene	Chronic	2.0E-03	mg/kg-day	2.0E-03	mg/kg-day	Blood	10,000	IRIS	01/05/05
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	1.0E-02	mg/kg-day	Liver	1,000	IRIS	01/05/05
Toluene	Chronic	2.0E-01	mg/kg-day	2.0E-01	mg/kg-day	Liver/Kidney	1,000	IRIS	01/05/05
Trichloroethene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	3.0E-03	mg/kg-day	Liver	30	IRIS	01/05/05
Benzo(a)pyrene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BEHP	Chronic	2.0E-02	mg/kg-day	2.0E-02	mg/kg-day	Liver	1,000	IRIS	01/05/05
Dibenzo (a,h)anthracene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	Chronic	2.0E-02	mg/kg-day	2.0E-02	mg/kg-day	General Toxicity	3,000	IRIS	01/05/05
PCP	Chronic	3.0E-02	mg/kg-day	3.0E-02	mg/kg-day	Liver/Kidney	100	IRIS	01/05/05
Arsenic	Chronic	3.0E-04	mg/kg-day	3.0E-04	mg/kg-day	Skin	3	IRIS	01/05/05
Manganese (drinking water)	Chronic	2.4E-02	mg/kg-day	9.6E-04	mg/kg-day	CNS	9	IRIS	01/05/05
Manganese (other media)	Chronic	7.0E-02	mg/kg-day	2.8E-03	mg/kg-day	CNS	3	IRIS	01/05/05

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfC: RfD: Target Organ	Dates (MM/DD/YY YY)
1,3,5-Trimethylbenzene	Chronic	6	ug/m3	N/A	N/A	General Toxicity	3,000	STSC	01/05/05
Benzene	Chronic	30	ug/m3	N/A	N/A	Immune System	300	IRIS	01/05/05
cis-1,2-Dichloroethene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
n-Butylbenzene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
n-Propylbenzene	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tetrachloroethene	Chronic	270	ug/m3	N/A	N/A	CNS	100	ATSDR	01/05/05
Toluene	Chronic	400	ug/m3	N/A	N/A	CNS	300	IRIS	01/05/05
Trichloroethene	Chronic	40	ug/m3	N/A	N/A	Liver	3,000	STSC	01/05/05
Vinyl Chloride	Chronic	100	ug/m3	N/A	N/A	Liver	30	IRIS	01/05/05

Table G-5

Non-Cancer Toxicity Data Summary

Naphthalene	Chronic	3	ug/m3	N/A	N/A	Respiratory	3,000	IRIS	01/05/05

Key
PCP = pentachlorophenol
BEHP = bis(2-ethylhexyl)phthalate
N/A = No information available
CNS = Central Nervous System
ATSDR = Agency for Toxic Substances and Disease Registry
IRIS = Integrated Risk Information System, U.S. EPA
STSC = Superfund Technical Support Center
MM/DD/YY = Month/Day/Year

This table provides non-carcinogenic risk information which is relevant to the chemicals of concern in leachate, wetland soil, and groundwater. Thirteen of the COCs have oral toxicity data indicating their potential for adverse non-carcinogenic health effects in humans. Chronic and subchronic toxicity data available for the thirteen COCs for oral exposures have been used to develop chronic oral reference doses (RfDs), provided in this table.

Reference doses are not available for the carcinogenic polycyclic aromatic hydrocarbons, benzo(a)pyrene and dibenzo(a,h)anthracene, and trichloroethene. Dermal RfDs are not available for any of the COCs. As was the case for the carcinogenic data, dermal RfDs can be extrapolated from oral RfDs by applying an adjustment factor as appropriate. Oral RfDs were adjusted for COCs with less than 50% absorption via the ingestion route (manganese only) to derive dermal RfDs for these COCs. Inhalation reference concentrations (RfCs) are available for the seven volatile COCs evaluated for the inhalation pathway. Benzo(a)pyrene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, pentachlorophenol, arsenic, and manganese are non-volatile contaminants and were not included in the evaluation of inhalation exposures.

Section 4: Risk Characterization

Risk characterization combines estimates of exposure with toxicity data to estimate potential health effects that might occur if no action were taken.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the daily intake levels (see *Section 2: Exposure Assessment*) by the CSF or by comparison to the unit risk value. These toxicity values are conservative upper bound estimates, approximating a 95% upper confidence limit, on the increased cancer risk from a lifetime exposure to a chemical. Therefore, the true risks are unlikely to be greater than the risks predicted. Cancer risk estimates are expressed as a probability, e.g. one in a million. Scientific notation is used to express probability. One in a million risk (1 in 1,000,000) is indicated by 1×10^{-6} or 1E-06. In this example, an individual is not likely to have greater that a one in a million chance of developing cancer over a lifetime as a result of exposure to the concentrations of chemicals at a site. All risks estimated represent an "excess lifetime cancer risk" in addition to the background cancer risk experienced by all individuals over a lifetime. The chance of an individual developing cancer from all other (non-site related) causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site related exposure is 10^{-4} to 10^{-6}. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient (HQ) is calculated by dividing the daily intake level by the RfD or RfC. A $HQ < 1$ indicates that an exposed individual's dose of a single contaminant is less than the RfD or RfC and that a toxic effect is unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (e.g. liver) within or across those media to which the same individual may reasonably be exposed. A $HI \leq 1$ indicates that toxic non-carcinogenic effects are unlikely.

The following is a summary of the media and exposure pathways that were found to present a risk exceeding EPA's cancer risk range and non-cancer threshold at the Site. Only those exposure pathways deemed relevant to Site conditions are presented in this ROD. Readers are referred to Section 5 and Tables 9.1 through 9.18 of the baseline human health risk assessment for a more comprehensive risk summary of all exposure pathways evaluated for all chemicals of potential concern and for estimates of the central tendency risk.

Recreational User

Tables G-6 through G-8 depict the carcinogenic and non-carcinogenic risk summary for the chemicals of concern in leachate and wetland soil evaluated to reflect potential future recreational exposure corresponding to the RME scenario. For the future young child and adult recreational user, carcinogenic and non-carcinogenic risks exceeded the EPA acceptable risk range of 10^{-4} to 10^{-6} and a target organ HI of 1. The exceedances were due primarily to the presence of bis(2-ethylhexyl)phthalate in leachate and manganese in wetland soil. The future risk associated with leachate exposure assumes that the LNAPL interceptor trenches are not maintained in the future or operated as designed, allowing free-phase groundwater contamination to migrate freely into leachate. As long as the LNAPL interceptor trenches are maintained properly and operated as designed, future risks associated with leachate exposures are estimated to be below risk management criteria.

Table G-6

Risk Characterization Summary – Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Young Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Leachate	Leachate	Access Road	BEHP	--	--	6E-04	--	6E-04
							Leachate Risk Total =	6E-04
							Total Risk =	6E-04

Key
BEHP = bis(2-ethylhexyl)phthalate
-- = Route of exposure is not applicable to this medium.

This table provides risk estimates for the significant routes of exposure for the future child and adult recreational user. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of a child's and adult's exposure to leachate, as well as the toxicity of the COC (bis(2-ethylhexyl)phthalate). The total risk from direct exposure to contaminated leachate at this Site to a future child and adult recreational user is estimated to be 6×10^{-4}. This risk level indicates that if no clean-up action is taken, an individual would have an increased probability of 6 in 10,000 of developing cancer as a result of Site-related exposure to the COCs.

Table G-7

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Young Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Leachate	Leachate	Access Road	BEHP	Liver	--	--	7E+00	7E+00
							Leachate Hazard Index Total =	7E+00
							Liver Hazard Index =	7E+00

Key
BEHP = bis(2-ethylhexyl)phthalate
-- = Route of exposure is not applicable to this medium.

This table provides hazard quotients (HQs) for each route of exposure and the hazard index (sum of the hazard quotients) for all routes of exposure for the future child and adult recreational user. The Risk Assessment Guidance (RAGS) for Superfund states that, generally, a hazard index (HI) of greater than 1 indicates the potential for adverse noncancer effects. The estimated HI of 7 indicates that the potential for adverse noncancer effects could occur from exposure to contaminated leachate containing bis(2-ethylhexyl)phthalate.

Table G-8
Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Young Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Wetland Soil	Rockwood Brook Wetland	Manganese	CNS	2E+00	--	N/A	2E+00
							Soil Hazard Index Total =	2E+00
							CNS Hazard Index =	2E+00

Key
CNS = Central Nervous System
N/A = Toxicity criteria are not available to quantitatively address this route of exposure.
-- = Route of exposure is not applicable to this medium.

This table provides hazard quotients (HQs) for each route of exposure and the hazard index (sum of the hazard quotients) for all routes of exposure for the future child and adult recreational user. The Risk Assessment Guidance (RAGS) for Superfund states that, generally, a hazard index (HI) of greater than 1 indicates the potential for adverse noncancer effects. The estimated HI of 2 indicates that the potential for adverse noncancer effects could occur from exposure to contaminated wetland soil containing manganese.

Adjacent Residential Groundwater Use

Tables G-9 and G-10 depict the carcinogenic and non-carcinogenic risk summary for the chemicals of concern in future adjacent residential wells evaluated to reflect potential future potable water exposure corresponding to the RME scenario, under the assumption that on-Site groundwater migrates to potable wells installed on the Troy Mills property, adjacent to or downgradient of the Site in the future. For the future adjacent resident using untreated groundwater as household water, carcinogenic and non-carcinogenic risks exceeded the EPA acceptable risk range of 10^{-4} to 10^{-6} and/or a target organ HI of 1 for groundwater. The exceedances were due to the presence of benzene, 1,3,5-trimethylbenzene, benzene, cis-1,2-dichloroethene, n-butylbenzene, n-propylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, naphthalene, pentachlorophenol, arsenic, and manganese in Site groundwater.

Table G-9

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Adjacent Resident
Receptor Age: Young Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Ground-water	Ground-water	Tap Water (Monitoring Wells)	Benzene	3E-06	1E-06	4E-07	--	5E-06
			Tetrachloroethene	1E-05	2E-07	6E-06	--	2E-05
			Trichloroethene	6E-05	3E-05	8E-06	--	1E-04
			Vinyl Chloride	1E-04	2E-06	5E-06	--	1E-04
			Benzo(a)pyrene	5E-06	N/A	N/A	--	5E-06
			BEHP	4E-05	N/A	5E-05	--	1E-04
			Dibenzo(a,h) anthracene	2E-06	N/A	N/A	--	2E-06
			Pentachlorophenol	1E-05	N/A	N/A	--	1E-05
			Arsenic	2E-04	N/A	1E-06	--	2E-04
							Groundwater Risk Total =	6E-04
							Total Risk =	6E-04

Key
BEHP = bis(2-ethylhexyl)phthalate
-- = Route of exposure is not applicable to this medium.
N/A = Not Applicable

This table provides risk estimates for the significant routes of exposure for the future child and adult adjacent resident exposed to groundwater used as household water. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of a child's and adult's exposure to groundwater, as well as the toxicity of the COCs. The total risk from direct exposure to contaminated groundwater at this Site to a future adjacent resident is estimated to be 6×10^{-4}. The COCs contributing most to this risk level are trichloroethene, vinyl chloride, bis(2-ethylhexyl)phthalate, and arsenic in groundwater. This risk level indicates that if no clean-up action is taken, an individual would have an increased probability of 6 in 10,000 of developing cancer as a result of Site-related exposure to the COCs in groundwater.

Table G-10

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Adjacent Resident
Receptor Age: Young Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water	Ground-water	Tap Water (Monitoring Wells)	1,3,5-Trimethylbenzene	General Toxicity/ Liver/ Kidney	7E-01	8E+00	9E-01	1E+01
			cis-1,2-Dichloroethene	Blood	3E+00	N/A	3E-01	4E+00
			n-Butylbenzene	Blood	3E+00	N/A	4E+00	7E+00
			n-Propylbenzene	Blood	5E+00	N/A	4E+00	9E+00
			Toluene	Liver/ Kidney	3E+00	2E+00	6E-01	5E+00
			BEHP	Liver	8E-01	N/A	8E-01	2E+00
			Naphthalene	General Toxicity	3E-01	2E+00	1E-01	2E+00
			Arsenic	Skin	3E+00	N/A	1E-02	3E+00
			Manganese	CNS	3E+01	N/A	3E+00	3E+01
							Groundwater Hazard Index Total =	7E+01
							General Toxicity Hazard Index =	1E+01
							Liver Hazard Index =	2E+01
							Kidney Hazard Index =	2E+01
							Blood Hazard Index =	2E+01
							Skin Hazard Index =	3E+00
							CNS Hazard Index =	3E+01

Key
BEHP = bis(2-ethylhexyl)phthalate.
CNS = Central Nervous System.
N/A = Toxicity criteria are not available to quantitatively address this route of exposure.

This table provides hazard quotients (HQs) for each route of exposure and the hazard index (sum of the hazard quotients) for all routes of exposure for the future adjacent resident exposed to groundwater used as household water. The Risk Assessment Guidance (RAGS) for Superfund states that, generally, a hazard index (HI) of greater than 1 indicates the potential for adverse noncancer effects. The estimated target organ HIs between 3 and 30 indicate that the potential for adverse effects could occur from exposure to contaminated groundwater.

Section 5: Uncertainties

Trichloroethene is being re-evaluated for carcinogenic potency by EPA. The high-end of the range of oral slope factors and unit risk values was used for risk estimation. This approach may have resulted in an overestimate of the risk associated with trichloroethene in groundwater. In addition, toxicity values were not available for sec-butylbenzene and tetrahydrofuran detected in groundwater, resulting in an underestimate of groundwater risk. These uncertainties will be periodically reviewed to address changes in and the availability of toxicity values for these compounds.

For the groundwater dermal contact pathway, risk associated with dermal absorption of chlorinated organic compounds may be underestimated. Permeability constants for the chlorinated organic compounds such as 1,2-dichloroethane, 1,2-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride tend to be underestimated by correlation modeling. This uncertainty may result in an underestimation of risk. In addition, risk associated with dermal absorption could not be quantified for all contaminants. Data needed to predict dermal absorption is insufficient for some compounds including benzo(a)pyrene, dibenzo(a,h)anthracene, and pentachlorophenol, . This uncertainty may also result in an underestimation of risk. These uncertainties will be periodically reviewed to address changes in the dermal absorption values for these compounds.

Airborne concentrations of volatile compounds for the showering/bathing scenario were estimated using accepted EPA exposure models. The use of modeling to estimate airborne concentrations of volatile compounds likely results in an over-estimate of risk since conservative assumptions were employed in the exposure modeling.

Fish tissue data were not collected for the Site. Therefore, the fish ingestion pathway was not quantitatively evaluated in the risk assessment, even though Rockwood Brook and Sand Dam Pond are suitable habitat for fish of edible size. Surface water and sediment concentrations in these surface water bodies are low and diminish with distance from the Site. In addition, Site COCs tend not to bioaccumulate in fish tissue and it is unlikely that a significant fraction of the total fish consumed by an individual would be from the brook and pond, due to their small area. As a result, it is unlikely that the fish ingestion pathway would be associated with a significant risk attributable to the Site.

2. Ecological Risk Assessment

A baseline ecological risk assessment (BERA) was completed for the Troy Mills Landfill Site to evaluate the likelihood and magnitude of potential ecological effects associated with historical disposal practices. The BERA evaluated the potential for contaminants in surface water and sediment in Rockwood Brook and wetland soil from the Rockwood Brook wetlands to impact ecological receptor populations.

Section 1: Identification of Chemicals of Concern

Chemicals of Potential Concern (COPCs) were identified using effects-based screening involving the comparison of maximum contaminant concentrations to ecological benchmarks for each medium and exposure area. Data used to identify COPCs are summarized in Table G-11 (Rockwood Brook surface water), Table G-12 (Rockwood Brook sediment) and Table G-13 (Rockwood Brook wetland soil). The COPCs identified in surface water include one VOC, five SVOCs, and four metals; COPCs identified in sediment include six VOCs, three SVOCs, and seven metals; COPCs in wetland soil include fourteen VOCs, seven SVOCs, and twelve metals.

Table G-11

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (COPCs)

Study Area: Troy Mills Landfill Superfund Site - Rockwood Brook
Medium: Surface Water

Chemical	Frequency of Detection	Maximum Detected Concentration (ug/L)	Location of Maximum Detected Concentration	Screening Criterion (ug/L)	Benchmark Type	COPC? [1]	Reason For Exclusion
Carbon disulfide	1 / 8	0.14	RBSW-4	0.92	SCV	No	BSV
Methyl acetate	1 / 8	3.0	SW-10	NA	NA	Yes	
Benzo(a) anthracene	1 / 8	0.01	RBSW-2	0.03	SCV	No	BSV
Benzo(a)pyrene	1 / 8	0.01	RBSW-2	0.01	Tier II	No	BSV
Benzo(b) fluoranthene	1 / 8	0.001	RBSW-2	NA	NA	Yes	
Benzo(g,h,i) perylene	2 / 8	0.03	RBSW-2	NA	NA	Yes	
Chrysene	1 / 8	0.01	RBSW-2	NA	NA	Yes	
2-Methyl-naphthalene	1 / 8	0.01	RBSW-5	NA	NA	Yes	
2,4,6-Trichlorophenol	1 / 8	0.01	RBSW-1	NA	NA	Yes	
Aluminum	5 / 5	124	RBSW-1	87	AWQC	Yes	
Arsenic	3 / 5	0.21	RBSW-5	150	AWQC	No	BSV
Barium	5 / 5	9.9	RBSW-2	3.9	Tier II	Yes	
Boron	5 / 5	10.8	RBSW-2	1.6	SCV	Yes	
Iron	5 / 5	142	RBSW-1	1,000	AWQC	No	BSV
Lead	3 / 5	6.9	RBSW-1	0.13	AWQC[2]	Yes	
Manganese	5 / 5	75.9	RBSW-1	120	SCV	No	BSV
Mercury	1 / 5	0.11	RBSW-1	0.77	AWQC	No	BSV
Nickel	5 / 5	1.3	RBSW-1	5.5	AWQC[2]	No	BSV
Zinc	5 / 5	11	RBSW-1	12	AWQC[2]	No	BSV

Key
[1] Analytes with maximum detected concentrations exceeding screening criteria or which lacked screening benchmarks were retained as COPCs.
[2] Metals criteria adjusted for Site hardness (7.0 mg/L as $CaCO_3$) using equations provided in USEPA, 2002.
COPCs - Chemicals of Potential Concern.
AWQC - National Ambient Water Quality Criterion freshwater chronic values (USEPA 2002).
SCV - Secondary Chronic Value as presented in Suter and Tsao (1996).
Tier II - Ecotox Thresholds Great Lakes Water Quality Initiative Tier II Methodology (USEPA, 1996).
BSV - Below screening value.
NA - Screening criterion not available.
ug/L = micrograms per liter (equivalent to parts per billion).

Table G-12

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (COPCs)

Study Area: Troy Mills Landfill Superfund Site - Rockwood Brook
Medium: Sediment

Chemical	Frequency of Detection	Maximum Detected Concentration (ug/kg)	Location of Maximum Detected Concentration	Screening Criterion (ug/L)	Benchmark Type	COPC?[1]	Reason For Exclusion
Acetone	7 / 9	40	RBSE-3	NA	NA	Yes	
2-Butanone	1 / 9	8.8	RBSE-3	NA	NA	Yes	
1,1-Dichloroethane	2 / 9	2.0	RBSE-2	NA	NA	Yes	
cis-1,2-Dichloroethylene	1 / 9	1.0	SD-08	NA	NA	Yes	
p-Isopropyltoluene	2 / 5	3.0	RBSE-3	NA	NA	Yes	
Styrene	1 / 9	2.0	RBSE-4	NA	NA	Yes	
Toluene	1 / 9	1.0	SD-08	587	SQB	No	BSV
1,1,1-Trichloroethane	1 / 9	2.0	SD-09	149	SQB	No	BSV
Benzaldehyde	1 / 9	43	RBSE-1	NA	NA	Yes	
Benzo(g,h,i)perylene	1 / 9	23	RBSE-1	149	LEL	No	BSV
BEHP	3 / 9	360	RBSE-1	NA	NA	Yes	
Dibenzo(a,h)anthracene	1 / 9	13	RBSE-1	53	LEL	No	BSV
Diethylphthalate	1 / 9	120	RBSE-1	552	SQB	No	BSV
Di-n-butylphthalate	4 / 9	65	RBSE-3	9,638	SQB	No	BSV
Fluoranthene	1 / 9	10	RBSE-1	2,541	SQC	No	BSV
Indeno(1,2,3-cd)pyrene	1 / 9	15	RBSE-1	175	LEL	No	BSV
2-Methylphenol	3 / 9	3.0	RBSE-1	NA	NA	Yes	
Aluminum	9 / 9	4,000,000	RBSE-1	NA	NA	Yes	
Arsenic	5 / 9	350	RBSE-1	8,200	ER-L	No	BSV
Barium	9 / 9	24,800	SD-09	NA	NA	Yes	
Beryllium	6 / 9	180	SD-09	NA	NA	Yes	
Cadmium	9 / 9	220	SD-09	1,200	ER-L	No	BSV
Chromium	9 / 9	6,200	SD-09	81,000	ER-L	No	BSV
Cobalt	9 / 9	2,500	SD-09	50,000	LEL	No	BSV
Copper	9 / 9	6,200	RBSE-5	34,000	ER-L	No	BSV
Cyanide	3 / 4	110	SD-37	100	LEL	Yes	
Iron	9 / 9	5,330,000	RBSE-3	20,000	LEL	Yes	
Lead	7 / 9	4,200	SD-09	47,000	ER-L	No	BSV
Manganese	9 / 9	263,000	SD-09	460,000	LEL	No	BSV
Nickel	9 / 9	3,500	RBSE-1	21,000	ER-L	No	BSV
Thallium	5 / 9	70	RBSE-1	NA	NA	Yes	
Vanadium	9 / 9	9,800	RBSE-1	NA	NA	Yes	
Zinc	5 / 9	15,500	RBSE-1	150,000	ER-L	No	BSV

Key
[1] Organic benchmarks are based on 0.88% sediment organic carbon content.
[2] Analytes with maximum detected concentrations exceeding screening criteria or which lacked benchmark values were retained as COPCs.
BEHP = bis(2-ethylhexyl)phthalate.
ug/kg = micrograms per kilogram (equivalent to parts per billion).
COPCs = Chemicals of Potential Concern.
BSV = Below screening value.
ER-L = NOAA Effects Range-Low (Long *et al.*, 1995; Long and Morgan, 1990 *cited in* USEPA, 1996).
SQB = USEPA Office of Solid Waste and Emergency Response Sediment Quality Benchmark (USEPA, 1996).
LEL = Ontario Ministry of Environment and Energy Lowest Effect Level (Persaud *et al.*, 1993).
NA = Not available.
RBSE- = sediment samples collected from Rockwood Brook in 2004.
SD- = sediment samples collected from Rockwood Brook in 2001.

Table G-13

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (COPCs)

Study Area: Troy Mills Landfill Superfund Site - Rockwood Brook
Medium: Wetland Soil

Chemical	Frequency of Detection	Maximum Detected Concentration (mg/kg)	Location of Maximum Detected Concentration	Screening Criterion (mg/kg)	Benchmark Type	COPC? [1]	Reason For Exclusion
Acetone	8 / 12	0.67	WESO-2	37	Mammal	No	BSV
2-Butanone	5 / 12	0.06	WESO-4	6,487	Mammal	No	BSV
sec-Butylbenzene	1 / 4	0.005	WESO-3	NA	NA	Yes	
tert-Butylbenzene	1 / 4	0.002	WESO-3	NA	NA	Yes	
Carbon disulfide	2 / 12	0.01	SD-03	NA	NA	Yes	
Cyclohexane	2 / 12	0.003	SD-06	NA	NA	Yes	
1,1-Dichloroethane	2 / 12	0.002	SD-03	NA	NA	Yes	
1,1-Dichloroethylene	1 / 12	0.002	SD-06	24	Mammal	No	BSV
cis-1,2-Dichloroethylene	8 / 12	0.04	SD-01	NA	NA	Yes	
trans-1,2-Dichloroethylene	1 / 12	0.001	SD-03	NA	NA	Yes	
Ethylbenzene	2 / 12	0.003	SD-06	NA	NA	Yes	
Isopropylbenzene	4 / 12	0.02	WESO-2	NA	NA	Yes	
Methyl acetate	2 / 12	0.01	SD-02	NA	NA	Yes	
Methylcyclo-hexane	3 / 12	0.001	SD-01	NA	NA	Yes	
Toluene	2 / 12	0.02	SD-06	52	Mammal	No	BSV
1,1,2-Trichloro-1,2,2-trifluoroethane	1 / 12	0.002	WESO-1	NA	NA	Yes	
1,1,1-Trichloroethane	1 / 12	0.001	SD-06	2,060	Mammal	No	BSV
Trichloroethylene	1 / 12	0.002	SD-06	1.4	Mammal	No	BSV
Trichlorofluoro-methane	1 / 12	0.004	SD-06	NA	NA	Yes	
1,2,4-Trimethylbenzene	1 / 4	0.001	WESO-3	NA	NA	Yes	
Xylene	1 / 12	0.01	SD-06	4.2	Mammal	No	BSV
Benzaldehyde	3 / 12	0.22	WESO-1	NA	NA	Yes	
Benzo(a) anthracene	3 / 12	0.01	WESO-1	NA	NA	Yes	
Benzo(a)pyrene	3 / 12	0.02	WESO-1	2.0	Mammal	No	BSV
Benzo(b) fluoranthene	3 / 12	0.03	WESO-5	NA	NA	Yes	
BEHP	10 / 12	59	WESO-3	0.9	Avian	Yes	
Diethylphthalate	3 / 12	0.37	WESO-2	100	Plant	No	BSV
Di-n-octylphthalate	8 / 12	2.4	WESO-2	NA	NA	Yes	
Fluoranthene	1 / 12	0.03	WESO-5	NA	NA	Yes	
Indeno (1,2,3-cd)pyrene	3 / 12	0.02	WESO-2	NA	NA	Yes	
Aluminum	12 / 12	16,400	WESO-1	0.30	SSL	Yes	
Antimony	4 / 5	0.25	WESO-2	0.25	Mammal	No	BSV
Arsenic	7 / 12	2.8	WESO-5	37	SSL	No	BSV
Barium	12 / 12	198	WESO-1	330	SSL	No	BSV
Beryllium	9 / 12	1.1	WESO-2	35	SSL	No	BSV

Table G-13

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (COPCs)

Study Area: Troy Mills Landfill Superfund Site - Rockwood Brook
Medium: Wetland Soil

Chemical	Frequency of Detection	Maximum Detected Concentration (mg/kg)	Location of Maximum Detected Concentration	Screening Criterion (mg/kg)	Benchmark Type	COPC? [1]	Reason For Exclusion
Boron	2 / 5	6.6	WESO-2	0.50	Plant	Yes	
Cadmium	11 / 11	0.51	SD-02	0.38	SSL	Yes	
Chromium	12 / 12	31	WESO-1	5.0	SSL	Yes	
Cobalt	12 / 12	48	WESO-2	13	SSL	Yes	
Copper	9 / 12	24	WESO-1	61	SSL	No	BSV
Cyanide	1 / 7	0.11	SD-07	237	Mammal	No	BSV
Iron	12 / 12	225,000	WESO-2	NA	NA	Yes	
Lead	11 / 12	19	WESO-5	16	SSL	Yes	
Manganese	12 / 12	83,000	WESO-1	322	Mammal	Yes	
Mercury	3 / 10	0.06	WESO-5	0.10	Earthworm	No	BSV
Nickel	10 / 12	11	WESO-2	11	Mammal	No	BSV
Selenium	6 / 12	3.5	SD-03	0.33	Avian	Yes	
Silver	1 / 12	0.07	WESO-5	2.0	Plant	No	BSV
Thallium	5 / 12	0.25	WESO-1	0.03	Mammal	Yes	
Vanadium	12 / 12	28	WESO-1	0.71	Mammal	Yes	
Zinc	5 / 12	60	WESO-1	12	Avian	Yes	

Key

[1] Analytes with maximum detected concentrations exceeding screening criteria or which lacked screening benchmarks were retained as COPCs.

BEHP = bis(2-ethylhexyl)phthalate.
mg/kg = milligrams per kilogram (equivalent to parts per million).
COPCs = Chemicals of Potential Concern.
BSV = Below screening value.
SSL = USEPA Interim Final Ecological Soil Screening Level (USEPA, 2003).
Mammal = Benchmark based on lowest mammalian value (Sample, *et al.*, 1996).
Avian = Benchmark based on lowest avian value (Sample *et al.*, 1996).
Earthworm = Benchmark based on toxicity concentrations for earthworm (Efroymson, *et al.*, 1997a).
NA = Benchmark not available.
WESO = wetland soil samples collected from the Rockwood Brook Wetland Study Area in 2004.
SD = wetland soil samples collected from the Rockwood Brook Wetland Study Area in 2001.

Section 2: Exposure Assessment

The Site consists of a landfill located in an area of mostly undeveloped woodlands. Other than the woodlands, the Site is bordered to the north by an 8-acre inactive, formerly State-permitted solid waste landfill, to the east by a former railroad bed currently used as a State-owned recreational trail, to the south by the eastern branch of Rockwood Brook, and to the west by a gravel access road, an approximately 1.5 acre palustrine forested wetland (referred to as the Rockwood Brook Wetland Study Area), and the west branch of Rockwood Brook. In areas of the wetland directly adjacent to Rockwood Brook, wetland soils are seasonally saturated. In areas of the wetland which are slightly mounded (i.e. where soils are relatively drier), vegetation is characterized by species more common to upland communities.

Based on initial Site evaluations, complete exposure pathways exist for organisms inhabiting wetland surface soils in the Rockwood Brook Wetland Study Area and organisms exposed to sediment, pore water, or surface water within Rockwood Brook. Species groups most likely to receive potential exposures to Site COPCs are those whose activities frequently bring them into direct contact with sediment and surface water, that directly consume aquatic plants and/or detritus, or that feed upon species possessing one or both of these characteristics.

Rockwood Brook provides habitat for a variety of semi-aquatic mammals, fish, predatory birds, amphibians, benthic invertebrates, and aquatic plants. The Rockwood Brook wetlands provide a habitat for songbirds, mammals, terrestrial invertebrates, and terrestrial plants. No protected species or species of special concern are known to inhabit any of the study areas.

Aquatic and semi-aquatic receptors may be exposed to COPCs through ingestion of contaminated prey, sediment, and surface water in Rockwood Brook. Due to the nature and extent of contaminants in the brook, organisms directly exposed to surface water (aquatic life, including invertebrates and fish) and directly exposed to sediments (benthic invertebrates) were selected for evaluation. Terrestrial receptors may accumulate COPCs through consumption of contaminated prey and incidental soil ingestion through foraging in the Rockwood Brook Wetland Study Area. Exposure pathways, assessment endpoints, and measurement endpoints are summarized below in Table G-14.

Table G-14

Ecological Exposure Pathways of Concern

Exposure Medium	Sensitive Environment Flag Y or N	Receptor	Endangered/ Threatened Species Flag Y or N	Exposure Routes	Assessment Endpoints	Measurement Endpoints
Surface Water	N	Aquatic invertebrates and warmwater fish populations	N	Ingestion and direct contact with chemicals in surface water	Sustainability (survival, growth, reproduction) of local populations of aquatic organisms	- Comparison of surface water COPC concentrations to federal ambient water quality criteria and threshold effects values from scientific literature.
Sediment	N	Benthic Invertebrates	N	Ingestion and direct contact with chemicals in sediment	Sustainability (survival, growth, reproduction) of local populations of benthic invertebrates	- Comparison of sediment COPC concentrations to benchmarks - Toxicity of sediment to *Hyallela azteca* and *Chironomus tentans*
Wetland Soil	N	Small terrestrial mammals	N	Dietary exposures of COPCs	Sustainability (survival, growth, reproduction) of local populations of short-tail shrew	- Comparison of soil COPC concentrations to benchmarks - Comparison of estimated dietary doses in short-tail shrew with TRVs

Key
COPC - Chemical of Potential Concern.
TRVs - Toxicity reference values.

Potential risk from COPCs to assessment populations in Rockwood Brook surface water was evaluated by comparison of measured concentrations to surface water quality benchmarks. Potential risk from COPCs to assessment populations in Rockwood Brook sediment was evaluated by comparison of measured concentrations of sediment COPC concentrations to sediment quality benchmarks. Potential risk from COPCs to assessment populations in Rockwood Brook wetland soil was evaluated by comparison of measured concentrations of wetland soil COPC concentrations to soil screening benchmarks.

Section 3: Ecological Effects Assessment

Surface water COPCs were compared to threshold effects concentrations obtained from the scientific literature. Since very few COPCs exceeded screening benchmarks, and since those exceedances were based on low detection frequency and concentrations, supplemental ecological effects analysis was not warranted.

Potential risk from COPCs to assessment populations in Rockwood Brook sediment was evaluated by comparing 10-day survival and growth toxicity tests in the laboratory using freshwater amphipod (*Hyalella azteca*) and midge insect larvae (*Chironomus tentans*) to background sediment. The results of the sediment toxicity tests indicated there were no

significant ecological effects on survival or growth of those species exposed to Rockwood Brook sediment in the laboratory.

Potential risk from COPCs to assessment populations in the Rockwood Brook Wetland Study Area was estimated using dietary exposure models. Because Site-specific tissue data for invertebrate prey were not available, doses were modeled from wetland soil. To assist in exposure estimation for small terrestrial mammals, COPC concentrations in prey (earthworms) were modeled directly from COPC concentrations in wetland soil. For the assessment population, a maximum exposure case was calculated to estimate dietary uptake to short-tailed shrew (*Blarina brevicauda*).

Modeled doses of Rockwood Brook wetland soil COPCs were compared to toxicity reference values (TRVs) obtained from the literature. TRVs were predominantly selected from studies which reported no-observed-adverse-effects-levels (NOAELS). When a suitable NOAEL was unavailable, studies which reported lowest-observed-adverse-effects-levels (LOAELs) were used and adjusted downward with an uncertainty factory of 10. The LOAEL to NOAEL adjustment was the only calculation in which an uncertainty factor was used. Hazard quotients (HQs) were then calculated for each COPC using the modeled doses and NOAEL TRVs. Risk to shrew was based on the magnitude of the HQ and an assessment of the uncertainty associated with the HQs.

Section 4: Risk Characterization

Based on comparison of surface water COPC to ecological effects concentrations from the scientific literature, there was negligible evidence of impact to aquatic receptors in Rockwood Brook surface water (Table G-15). Based on the results of the sediment toxicity testing, there was negligible evidence of impacts to benthic invertebrates from exposure to sediments in Rockwood Brook (Table G-15).

Table G-15

COC Concentrations Expected to Provide Adequate Protection of Ecological Receptors[1]

Habitat Type/Medium	Exposure Medium	COC	Protective Level	Units	Basis	Assessment Endpoint
Rockwood Brook	Surface Water	NA	NA	NA	NA	Sustainability (survival, growth, reproduction) of local populations of aquatic organisms
	Sediment	NA	NA	NA	NA	Sustainability (survival, growth, reproduction) of local populations of benthic invertebrates
Rockwood Brook Wetland Study Area	Soil	NA	NA	NA	NA	Sustainability (survival, growth, reproduction) of local populations of small terrestrial mammals

Key
[1] No COCs were identified resulting in an actionable risk.

Shrew HQs for wetland soil COPCs were below 1.0, except for manganese which was 2.5 in the maximum exposure case. For the remaining COPCs, the food chain model indicates there is negligible risk to shrew. The upper confidence limit (95% UCL) of the soil concentration of manganese was calculated to represent the reasonable maximum exposure (RME) to occur in the Rockwood Brook Wetland Study Area; an average (arithmetic mean) concentration was also calculated. Under the UCL and the average scenarios, the manganese HQs in the Rockwood Brook Wetland Study Area drop to below 1.0. Given the uncertainties and assumptions inherent in the use of soil uptake factors and exposure models for manganese, and given that all other wetland soil COPCs besides manganese showed negligible risk in the maximum exposure case, the risk to shrew from wetland soil COPCs was determined to be negligible (Table G-15).

Based on the environmental sampling performed at the Troy Mills Landfill Site, Site-specific toxicity testing, modeled exposures, comparison to background concentrations, and considering all uncertainties, the BERA concludes there is a negligible ecological risk to aquatic life within Rockwood Brook surface water and sediment and wildlife in the adjacent wetland area.

Section 5: Uncertainties

Several COPCs in sediment lacked suitable screening-level benchmarks. However, whole sediment toxicity tests were utilized which evaluate the toxicity of all COPCs regardless of the source. Because no significant toxicity was observed in sediment toxicity tests conducted in two species, the lack of screening benchmarks for sediment does not contribute uncertainty to the final risk conclusions. Although short-term (i.e., 10-day) sediment toxicity tests were performed, the lack of long-term (e.g., 28-day) tests is not considered a significant source of uncertainty since the short-term tests were definitive and conclusive.

At the conclusion of EPA's drum removal activities, a two-foot permeable soil cap was constructed over the former disposal area. The cap is constructed of a minimum of 18-inches of clean sand fill from a nearby sand quarry and 6-inches of loam that was hydroseeded. No ecological risk has assumed for the upland sand and soil used to backfill and cap the drum disposal excavation area.

For most wetland soil COPCs lacking screening benchmarks, there were mammalian TRVs available to calculate HQs. However, for a few of the VOCs detected in low concentration in wetland soil, mammalian TRVs were not available. The lack of TRVs for these COPCs represents a source of uncertainty in the BERA. However, due to the potential to volatilize into air, low levels of VOCs in wetland soil are unlikely to pose a significant risk to mammals.

Because Site-specific tissue data were not available for use in the shrew model, earthworm tissue concentrations were modeled from soil concentrations using regression equations and uptake factors. Although resulting in an uncertainty, the assumptions employed in the uptake equations are conservative and resulted in an overestimation of risk. In addition, conservative exposure assumptions and model parameters were used that also tended to overestimate risk.

3. Basis for Response Action

Because the baseline human health risk assessment revealed that future recreational users and near-Site residents potentially exposed to compounds of concern in groundwater, LNAPL-contaminated leachate, and wetland soil via ingestion or direct contact may present an unacceptable human health risk (e.g., cancer risk exceeds 1E-04 and HI exceeds 1.0), actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health or welfare. The baseline ecological risk assessment concluded that there is negligible ecological risk to organisms within Rockwood Brook surface water, sediment, and wetlands at the Troy Mills Landfill Site.

The remedial action will address this endangerment through monitored natural attenuation of groundwater contaminants; collection and off-Site disposal of LNAPL; monitoring of groundwater, surface water, sediment, leachate, and wetland soil; maintaining the permeable soil cap over the former drum disposal area; and implementing appropriate institutional controls.

H. REMEDIATION OBJECTIVES

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, response action objectives (RAOs) were developed to aid in the development and screening of alternatives. These RAOs were developed to mitigate, restore and/or prevent existing and future potential threats to human health and the environment. The RAOs for the selected remedy for the Site are:

- Contain and remove LNAPL to the extent practicable and prevent dermal contact exposure to LNAPL-contaminated leachate until the presence of LNAPL has dissipated. The baseline human health risk assessment concluded that elevated levels of bis(2-ethylhexyl)phthalate in LNAPL-contaminated leachate pose a potential cancer risk and non-cancer hazard to future adult and young child recreational users of the Site.

- Limit migration of groundwater contaminants beyond a designated New Hampshire groundwater management zone (GMZ) to downgradient areas, and over time, restore all Site groundwater to safe drinking water levels. In addition, prevent ingestion of Site groundwater until it has been restored to safe drinking water levels. The baseline human health risk assessment concluded that elevated levels of VOCs, SVOCs, and metals pose a cancer and non-cancer hazard to future adult and young child residential drinking water users. In addition, the human health risk assessment concluded that an elevated level of naturally-occurring manganese in wetland soils carried by the migration of groundwater to the adjacent wetlands poses a non-cancer hazard to future adult and young child recreational users.

- Implement EPA's presumptive capping remedy for landfill sites to continue to prevent direct contact with residual soils within the former drum disposal area, through the maintenance of the permeable soil cap installed as part of EPA's removal action. A risk assessment was not performed to quantitatively assess exposure risks from the residual soils as the soils are currently under a two-foot soil cap and not available to exposure under current or reasonably-anticipated future recreational land uses. Implementation of EPA's presumptive capping remedy will ensure that the cap is maintained to prevent potential future exposures.

I. DEVELOPMENT AND SCREENING OF ALTERNATIVES

1. Statutory Requirements/Response Objectives

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with all federal and more stringent state environmental and facility siting standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

2. Technology and Alternative Development and Screening

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for the Troy Mills Landfill Site.

With respect to source control, the RI/FS developed a range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances is a principal element. This range included an alternative that removes or destroys hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long term management. This range also included alternatives that treat the principal threats posed by the Site but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed; alternative(s) that involve little or no treatment but provide protection through engineering or institutional controls; and a no action alternative.

With respect to groundwater response actions, the RI/FS developed a limited number of remedial alternatives that attain Site-specific remediation levels within different time frames using different technologies and natural processes; and a no action alternative.

As discussed in Section 3 of the FS, LNAPL, groundwater, and soil treatment technology options were identified, assessed and screened based on implementability, effectiveness, and cost. These technologies were combined into source control and management of migration alternatives. Section 4 of the FS presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories identified in Section 300.430(e)(3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated in detail in Section 5 of the FS.

In summary, of the three LNAPL source control, three residual soil source control, and four management of migration remedial alternatives screened in Section 4 of the FS, all were retained as possible options for cleanup of the Site. From this initial screening, remedial options were combined, and three LNAPL source control, three residual soil source control, and four management of migration alternatives were selected for detailed analysis.

J. DESCRIPTION OF ALTERNATIVES

This Section provides a narrative summary of each source control and management of migration alternative evaluated.

1. Source Control Alternatives Analyzed

Between July 2004 and the summer of 2005, EPA excavated and removed 7,692 55-gallon drums from the two-acre former drum disposal area as part of the time-critical removal action. In addition, 29,924 gallons of flammable liquid waste, 26,244 tons of heavily contaminated soil, and 3,099 cubic yards of waste sludge were removed from the Site and disposed of at EPA-approved facilities. Post-excavation sampling and laboratory analyses conducted by EPA identified no soils with contaminant concentrations above NHDES soil screening criteria and confirmed that soils with the potential to leach contaminants into groundwater had been effectively removed from the Site. In summer 2005, a minimum two-foot thick permeable soil cap was constructed over the backfilled excavation area to eliminate potential direct contact exposures. With the completion of the removal action, all known drums have been removed from the Troy Mills Landfill Site.

Removal and off-Site disposal of the drums, their contents, and heavily contaminated soils represents a significant source control accomplishment. However, the remaining sources present at the Site (LNAPL and residual contaminated soils) still require remedial actions in order to protect human health and the environment.

A. LNAPL Source Control Alternatives

The LNAPL source control alternatives analyzed for the Site include:

- L-1: No action;
- L-2: Maintain LNAPL Interceptor Trenches (Limited Action Alternative)
- L-3: Active Extraction of LNAPL

Each of the three LNAPL source control alternatives is summarized below. A more complete, detailed presentation of each alternative is found in Section 5 of the FS Report.

L-1: No Action

Alternative L-1 is the "No Action" alternative required by the NCP. No remedial actions (including no monitoring) would be conducted in relation to the LNAPL/leachate under this

alternative. Therefore, only naturally-occurring processes would be working towards achieving RAOs. While upgradient sources have recently been removed, uncontrolled residual contamination may still exist for a moderate time period. Five-year reviews of the remedy would still be required by CERCLA, because of waste being left in place.

L-1: No Action

Treatment Components	None
Containment Components	None
Institutional Control Components	None
Monitoring Requirement	None
Operation and Maintenance Requirements	Review of Site conditions and risks at five year intervals
Key ARARs	Chemical-specific ARARs only, pertaining to standards for quantifying Site risks. Risks not addressed by the No-Action Alternative. See Appendix D of the FS.
Long-Term Reliability	Not applicable
Quantity of Untreated Wastes and/or Residuals	An estimated 8,000 gallons of LNAPL would not be captured or monitored.
Estimated Time to Design and Construct	Not applicable
Estimated Time to Reach Remediation Goals	Over 30 years
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Site would not be available for reuse.
Cost	• Capital Cost: $0 • O&M Costs: $0 (NPW) • Periodic Costs: $12,400 (NPW), for 5-year reviews • Total NPW Costs: $12,400

NPW = Net Present Worth (using a 7% discount rate).

L-2: Maintain LNAPL Interceptor Trenches (Limited Action Alternative)

The Site currently has three LNAPL interceptor trenches which were installed by EPA in 2003 as part of the removal action. They consist of slotted concrete structures placed at the top of the water table. The downgradient sides of the trenches are covered with a geomembrane designed to limit the migration of LNAPL. The trenches capture LNAPL before it discharges along with groundwater along the western edge of the former drum disposal area. The LNAPL is recovered periodically via vacuum extraction or absorbed on sorbent booms. Based on data reviewed during the RI, the trenches appear to be intercepting LNAPL properly. Removal of this contaminant source appears to have improved the water quality of leachate downgradient of the trenches. However, continued maintenance and monitoring is required to ensure that this remedy remains protective. Disposal of collected LNAPL is included as part of this remedy. Under this alternative, EPA would continue to maintain and operate the existing interceptor trenches until LNAPL levels dissipate.

The major components of this alternative include removal and disposal of collected LNAPL, institutional controls, and five-year reviews. As contaminants would remain on-Site in this area, five-year reviews would be conducted to evaluate the remedy. Continued monitoring of the trenches would include routine maintenance of the trench system and periodic gauging and

removal of collected LNAPL. Institutional controls would consist of deed restrictions to prevent the disturbance of the LNAPL interceptor trenches.

L-2: Maintain LNAPL Interceptor Trenches

Treatment Components	None
Containment Components	Use of existing LNAPL interceptor trenches to capture and collect free product.
Institutional Control Components	Deed restrictions to prevent disturbance of the trench system.
Monitoring Requirement	Periodic monitoring of LNAPL in the trenches would be performed, and LNAPL removed and disposed of off-Site.
Operation and Maintenance Requirements	Review of Site conditions and risks at five year intervals
Key ARARs	RCRA/NH Hazardous Waste Regulations. See Appendix C of the ROD.
Long-Term Reliability	Current data indicates that the trenches are working effectively to capture LNAPL.
Quantity of Untreated Wastes and/or Residuals	None
Estimated Time to Design and Construct	Not applicable. The trenches have already been constructed.
Estimated Time to Reach Remediation Goals	5 years. RAOs would be achieved upon removal of all LNAPL from groundwater using the trenches.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Site would be available for residential use.
Cost	• Capital Cost: $10,800 • O&M Costs: $560,467 (NPW) • Periodic Costs: $16,236 (NPW), for 5-year reviews and trench decommissioning upon completion • Total NPW Costs: $587,503

NPW = Net Present Worth (using a 7% discount rate).
RCRA = Federal Resource Conservation and Recovery Act.
NH = New Hampshire
PRGs = Preliminary remediation goals.

L-3: Extraction of LNAPL

Under this alternative, shallow extraction wells would be utilized to form a migration barrier and extract contaminated groundwater/LNAPL prior to breakout. This would prevent direct exposure to the contaminants and would also require treatment and/or disposal of the extracted fluids. An on-Site treatment train of standard processes would be developed to attain preliminary remediation goals (PRGs) and applicable disposal/discharge criteria. While the extracted LNAPL would be disposed of off-Site, the treated groundwater would either be reinjected into the ground, or discharged to Rockwood Brook.

The major components of this alternative include a pre-remedial study, Site preparation, installation and operation of the shallow groundwater/LNAPL collection and treatment system, environmental monitoring, institutional controls, and five-year reviews.

Pre-remedial study would include detailed hydrogeological studies to design an appropriate collection and treatment system including determining required pumping rates and extraction

well locations and bench-scale testing to develop an appropriate treatment system. For the purposes of this ROD, it is assumed that ten shallow (less than 20-feet deep) extraction wells would be placed at 20-foot intervals in the same area as the existing interceptor trenches along with three additional monitoring wells installed to evaluate the remedy. A treatment train consisting of standard processes (i.e., oil/water separator, precipitation, and UV/chemical oxidation) would be used to treat an assumed flow rate of 5 gallons per minute (gpm). Residuals, including LNAPL, would be disposed of off-Site in accordance with all applicable disposal standards.

Environmental monitoring would be performed to evaluate the success of the remedy. Five-year reviews would be conducted to evaluate the remedy once every five years until the remedy was complete.

Deed restriction would be required to prevent disturbance of the LNAPL extraction and treatment system.

L-3: Extraction of LNAPL

Treatment Components	• Extraction wells to remove LNAPL. • Treatment system to treat extracted LNAPL and groundwater.
Containment Components	None
Institutional Control Components	Deed restrictions required to prevent disturbance of the extraction/treatment system.
Monitoring Requirement	Periodic monitoring of LNAPL levels in extraction wells.
Operation and Maintenance Requirements	Review of Site conditions and risks at five year intervals
Key ARARs	RCRA/NH Hazardous Waste Regulations, Clean Water Act, Clean Air Act. See Appendix D of the FS.
Long-Term Reliability	The technologies utilized are known to be reliable. Extraction wells are reliable for limiting migration and collection of LNAPL and contaminated leachate/groundwater.
Quantity of Untreated Wastes and/or Residuals	None
Estimated Time to Design and Construct	1-2 years
Estimated Time to Reach Remediation Goals	5 years. RAOs would be achieved upon removal of all LNAPL from the Site and the reduction of contaminant levels in leachate to PRGs.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Site would be available for residential use.
Cost	• Capital Cost: $1,105,931 • O&M Costs: $1,061,912 (NPW) • Periodic Costs: $50,578 (NPW) • Total NPW Costs: $2,218,421

NPW = Net Present Worth (using a 7% discount rate).
RCRA = Federal Resource Conservation and Recovery Act.
NH = New Hampshire.
PRGs = Preliminary remediation goals.

B. Former Drum Disposal Area Soils Source Control Alternatives

As noted previously, EPA's Removal Program completed a drum removal action in the summer of 2005 which included the excavation and off-Site disposal of 26,244 tons of heavily contaminated soil. Soils that met contaminant field-based screening levels were segregated from the materials to be disposed of, then backfilled into the excavation, and capped with a two-foot permeable soil cap. Sampling and analysis of the backfilled soils conducted before the construction of the cap found no exceedances of State soil screening criteria. However, the backfilled soils still retain low levels of contaminants, and as such, could pose a risk to human health and the environment if exposed. The source control alternatives analyzed for the former drum disposal area soils at the Site include:

- FDDA-1: No action;
- FDDA-2: Maintain Permeable Soil Cap (Limited Action Alternative)
- FDDA-3: Low Permeability Cap

Each of the three former drum disposal area soils source control alternatives is summarized below. A more complete, detailed presentation of each alternative is found in Section 5 of the FS Report.

FDDA-1: No Action

Alternative GW-1 is the "No Action" alternative required by the NCP. No remedial actions (including monitoring) would be conducted under this alternative. While source drums and soils have recently been removed, residual contaminated soils remain within the former drum disposal area. In addition, no measures would be taken to maintain the permeable soil cap that was constructed over the former drum disposal area and no action would be taken to prevent potential direct contact exposures. Five-year reviews of the remedy would still be required by CERCLA, because of waste being left in place.

FDDA-1: No Action

Treatment Components	None
Containment Components	None
Institutional Control Components	None
Monitoring Requirement	None
Operation and Maintenance Requirements	Review of Site conditions and risks at five year intervals
Key ARARs	Chemical-specific ARARs only, pertaining to standards for quantifying Site risks. Risks not addressed by the No-Action Alternative. See Appendix D of the FS.
Long-Term Reliability	Not applicable
Quantity of Untreated Wastes and/or Residuals	25,000-30,000 cubic yards of residual soils.
Estimated Time to Design and Construct	Not applicable
Estimated Time to Reach Remediation Goals	Never
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Site would not be available for reuse.
Cost	• Capital Cost: $0 • O&M Costs: $0 (NPW) • Periodic Costs: $12,400 (NPW), for 5-year reviews • Total NPW Costs: $12,400

NPW = Net Present Worth (7% discount rate).

FDDA-2: Maintain Permeable Soil Cap (Limited Action Alternative)

Under this alternative, the two-foot vegetated soil cover installed in Summer 2005 would be retained to prevent direct exposure to the residual soil contaminants while still allowing precipitation to infiltrate across the area. This infiltration is beneficial to the Monitored Natural Attenuation (MNA) remedy for groundwater (see Appendix C of the FS). Precipitation infiltrating to the groundwater is expected to re-oxygenate the groundwater, and the primary aromatic VOCs at the Site are expected to show improved reduction under aerobic conditions facilitated by a permeable soil cap (see Appendix C of the FS). As the source drums and heavily contaminated soils have been removed from the area, only remnant contamination in the backfilled soils may retain some risk to human health. Institutional controls would be implemented to restrict activities that would result in disturbance of the permeable soil cap. Maintenance of the cap would be required over time.

The major components of this alternative include cap maintenance, institutional controls, and five-year reviews.

Cap Maintenance. The minimum two-foot permeable soil cap prevents direct contact exposures to the underlying residual contaminated soil. The cap is constructed of a geotextile placed over the residual soils, a minimum of 18 inches of sand from a nearby sand quarry, and 6 inches of topsoil which was hydroseeded to protect the surface of the cap from erosion. In

addition, several drainage structures were constructed (riprap drainage swales) to limit cap erosion due to surface runoff. All of the components would be maintained to preserve the protectiveness of the remedy.

Environmental Monitoring. Regular inspections will be conducted to document that the permeable soil cap is properly maintained. If the cap is found to be damaged, corrective action would be taken to repair the cap. At some future time in support of NPL site deletion, if groundwater PRGs are obtained, an evaluation may be conducted to determine whether the backfilled soil under the cap poses a risk to human health or the environment. If risks are still present, groundwater monitoring would continue to be required as part of the closure requirements for the cap.

Institutional Controls. Institutional controls would be implemented in the form of land use deed restrictions (i.e., limitations restricting disturbance of the cap) to prevent exposure to contaminated soils.

Five-Year Reviews. As contaminants would remain in place, five-year reviews would be conducted to evaluate the remedy per EPA guidance. Additional actions may be implemented, if necessary, as a result of these reviews or if regulatory or statutory standards for cleanup change.

FDDA-2: Maintain Permeable Soil Cap

Treatment Components	None
Containment Components	Soil cap prevents direct contact exposures
Institutional Control Components	Land use deed restrictions that restrict activities that disturb the cap would be implemented.
Monitoring Requirement	Monitoring of Site conditions to make sure the cap is not disturbed.
Operation and Maintenance Requirements	• Review of Site conditions and risks at five year intervals • Regular inspections of the cap and cap repair as needed
Key ARARs	NH Solid Waste Standards. See Appendix C of the ROD.
Long-Term Reliability	• Capping is a well-established, reliable technology. • Reliability of institutional controls requires effective oversight and enforcement.
Quantity of Untreated Wastes and/or Residuals	25,000-30,000 cubic yards
Estimated Time to Design and Construct	Not applicable. The permeable soil cap has already been constructed.
Estimated Time to Reach Remediation Goals	RAOs would be achieved upon implementation of institutional controls, likely less than one year.
Use of Presumptive Remedies or Innovative Technologies	Remedy alternative relies on EPA's presumptive capping remedy guidance for landfill sites.
Expected Reuse Outcomes	Site would be available for passive use (i.e., hiking and other activities that would not disturb the cap).
Cost	• Capital Cost: $10,800 • O&M Costs: $47,120 (NPW) • Periodic Costs: $12,400 (NPW), for 5-year reviews • Total NPW Costs: $70,320

NH = New Hampshire.
NPW = Net Present Worth (7% discount rate).

FDDA-3: Low Permeability Cap

Under this alternative, soils in the former drum disposal area would be covered by a protective, low-permeability cap to prevent both direct exposure to the contaminants and limit precipitation from infiltrating across the area. Leaching of remaining contaminants in the soil would be reduced by this type of cap; however, limiting infiltration may also reduce the effectiveness of groundwater MNA. The primary aromatic VOCs at the Site would be expected to show improved reduction under aerobic conditions facilitated by a permeable soil cap (see Appendix C of the FS). Institutional controls would be implemented to restrict activities that could potentially damage the Site. Maintenance of the cap would be required over time.

The major components of this alternative include Site preparation, cap construction, monitoring, institutional controls, and five-year reviews.

Site Preparation. Site preparation activities for cap construction include the placement of erosion control materials to prevent migration of contaminated soil. Furthermore, the existing two-foot cover and topsoil may need to be partially removed depending on cap design requirements.

Cap Construction. For this alternative, it is assumed that the following cap design would be utilized: placement of a cap support layer, if necessary, placement of a low-permeability soil layer (1 foot, $\leq 10^{-4}$ cm/sec) followed by a geomembrane (40 mil), drainage layer (geosynthetic drainage net, 0.1 cm/sec), cover soil (2 feet), topsoil (6 inches), and hydroseed. In addition, several drainage structures would be constructed, such as riprap and crushed stone drainage swales and storm drains to carry precipitation away from the cap area.

Environmental Monitoring. Regular inspections would be conducted to document that the cap is properly maintained. If the cap is found to be damaged, corrective action would be taken to repair and maintain the impermeability of the cap. At some future time in support of NPL site deletion, if groundwater PRGs are obtained, an evaluation may be conducted to determine whether the backfilled soil under the cap poses a risk to human health or the environment. If risks are still present, groundwater monitoring would continue to be required as part of the closure requirements for the cap.

Institutional controls. Institutional controls would be implemented in the form of land use deed restrictions (i.e., limitations restricting disturbance of the cap) to prevent exposure to contaminated soils and to maintain the impermeability of the cap.

Five-Year Reviews. As contaminants will remain in place, five-year reviews would be conducted to evaluate the remedy per EPA guidance. Additional actions may be implemented if necessary as a result of these reviews or if regulatory or statutory standards for cleanup change.

FDDA-3: Low Permeability Cap

Treatment Components	None
Containment Components	Soil cap prevents direct contact exposures
Institutional Control Components	Land use deed restriction that restrict activities that disturb the cap would be implemented.
Monitoring Requirement	Monitoring of Site conditions to make sure the cap is not disturbed.
Operation and Maintenance Requirements	• Review of Site conditions and risks at five year intervals • Regular inspections of the cap, and cap repair as needed
Key ARARs	NH Solid Waste Standards. See Appendix D of the FS.
Long-Term Reliability	• Capping is a well-established, reliable technology. • Reliability of institutional controls requires effective oversight and enforcement.
Quantity of Untreated Wastes and/or Residuals	25,0000-30,000 cubic yards
Estimated Time to Design and Construct	1-2 years.
Estimated Time to Reach Remediation Goals	RAOs would be achieved upon construction of the impermeable cap and implementation of institutional controls, likely less than one year.
Use of Presumptive Remedies or Innovative Technologies	Remedy alternative relies on EPA's presumptive capping remedy guidance for landfill sites.
Expected Reuse Outcomes	Site would be available for passive use (i.e., hiking and other activities that would not disturb the cap).
Cost	• Capital Cost: $1,053,353 • O&M Costs: $50,840 (NPW) • Periodic Costs: $12,400 (NPW), for 5-year reviews • Total NPW Costs: $1,116,593

NH = New Hampshire.
NPW = Net Present Worth (7% discount rate).

2. Management of Migration Alternatives Analyzed

Management of migration alternatives address contaminants that have migrated into and with the groundwater from the original source of contamination. At the Site, contaminants have migrated from the former drum disposal area into groundwater and to the adjacent Rockwood Brook and its wetlands. The management of migration alternatives analyzed for the Site include:

- GW-1: No Action
- GW-2: Monitored Natural Attenuation (Limited Action Alternative)
- GW-3: MNA with In-Situ Treatment
- GW-4: Pump and Treat

Each of the four management of migration alternatives is summarized below. A more complete, detailed presentation of each alternative is found in Section 5 of the FS Report.

GW-1: No Action

Alternative GW-1 is the "No Action" alternative required by the NCP. No remedial actions (including monitoring) would be conducted in relation to the Site-wide groundwater under this

alternative. Therefore, only naturally-occurring processes would be working towards achieving RAOs. While source drums and soils have recently been removed, uncontrolled groundwater contamination may still exist and no measures would be taken to prevent use of the groundwater as a drinking supply source or to monitor the effectiveness of naturally-occurring processes. Five-year reviews of the remedy would still be required by CERCLA, because of waste being left in place.

GW-1: No Action

Treatment Components	None
Containment Components	None
Institutional Control Components	None
Monitoring Requirement	None
Operation and Maintenance Requirements	Review of Site conditions and risks at five year intervals
Key ARARs	Chemical-specific ARARs only (SDWA), pertaining to standards for quantifying Site risks. Risks not addressed by the No-Action Alternative. See Appendix D of the FS.
Long-Term Reliability	Not applicable
Quantity of Untreated Wastes and/or Residuals	An estimated 12.5 million gallons of groundwater would be left untreated, unrestricted, and not monitored.
Estimated Time to Design and Construct	Not applicable
Estimated Time to Reach Remediation Goals	RAOs and PRGs might be achieved in less than 30 years.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Site groundwater would not be available for reuse.
Cost	• Capital Cost: $0 • O&M Costs: $0 (NPW) • Periodic Costs: $12,400 (NPW), for 5-year reviews • Total NPW Costs: $12,400

NPW = Net Present Worth (7% discount rate).
SDWA = Safe Drinking Water Act.

GW-2: Monitored Natural Attenuation (Limited Action Alternative)

In the RI, groundwater contaminant biodegradation is shown to be occurring naturally at the Site. Under this alternative, monitored natural attenuation (MNA) would be established as the primary remedy component. Institutional controls would be implemented to restrict groundwater use as a potable water supply until groundwater cleanup levels are achieved and to require notification if land use changes on the property. For this alternative, monitoring is critical to determine if contaminant concentrations are being reduced effectively. While some of the contaminants are not prime candidates for MNA, other Site actions (e.g., source drum/soils removal, LNAPL collection, and maintenance of a permeable cap over the drum excavation area) are expected to result in contaminant concentration reduction to below PRGs over time.

The major components of this alternative include monitoring well installation, MNA, environmental monitoring, institutional controls, and five-year reviews.

Monitoring Well Installation. Under this alternative, it is assumed that up to five new monitoring wells would be installed to provide further information on contaminant extent and degradation. These wells would be screened in the shallow overburden at an assumed depth of less than 20 feet.

MNA. Natural attenuation is defined by EPA as "...a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil and groundwater." Such in-situ processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants. Biodegradation, volatilization, transformation, and destruction reduce the mass of contaminants in groundwater. The remaining processes reduce the concentration of contaminants; however, the overall mass does not change.

Degradation reactions that act on contaminants such as chlorinated VOCs are hydrolysis and elimination. The rates of biologically-mediated reactions are much faster than abiotic reactions. Dispersion and dilution reduce the concentrations of contamination downgradient and are also recognized as important natural attenuation processes by EPA. Mechanical mixing that occurs as groundwater is forced around particles is known as dispersion and distributes aqueous contamination throughout a larger area as the groundwater advects downgradient. Dilution of the dissolved compounds occurs as the groundwater interacts with less concentrated groundwater and infiltrated precipitation. Sorption of chemicals onto the surface of soil particles will slow advection and dispersion rates of dissolved contaminants. Volatilization transfers dissolved VOCs to the vapor phase in the vadose zone and eventually to the atmosphere. Regular groundwater monitoring is used to evaluate these natural attenuation processes.

Based on information presented in the RI, active biodegradation of chlorinated VOCs and aromatic VOCs is occurring at the Site. Elevated manganese levels are associated with the degrading dissolved organics in the plume and are expected to reduce over time along with the attenuation of the organics. Although the length of natural attenuation processes is not clear based on the source control response actions implemented, 30 years is assumed for costing purposes. Note that modeling performed as part of the RI shows that some contaminants will be reduced to PRGs in less than 30 years, while others could take longer than that. Only further monitoring will be able to determine a better estimate of remediation time.

Environmental Monitoring. Environmental monitoring would be performed in order to evaluate the progress/success of the remedy. Groundwater monitoring would consist of collecting samples from a total of approximately 20 monitoring wells. Surface water, sediment, leachate, and wetland soil samples would also be collected from locations within Rockwood Brook and the adjacent wetland to evaluate the effect of contaminated groundwater discharge on Rockwood Brook and the adjacent wetland. The monitoring would be performed periodically at a frequency to be determined during the initial remedial action phase of Site cleanup. Analytical parameters would likely include VOCs, SVOCs, metals, MNA parameters (i.e., carbon dioxide, methane/ethane/ethane, and volatile fatty acids), and water quality parameters (i.e., alkalinity, chloride, nitrate, nitrite, ortho-phosphate, sulfate, and total organic carbon).

Wetland soil sampling would be conducted to determine if elevated levels of naturally-occurring manganese still persist in the wetland. Manganese is not a known contaminant attributable to wastes disposed of at the Site. However, manganese is often mobilized to groundwater from soils when an aquifer is in a reduced state due to organic contamination. As the wetland is the discharge point for groundwater, dissolved-phase manganese contacting the atmosphere is oxidized and precipitates out in the wetland, accounting for the higher concentration in that area. Manganese concentrations in wetland soils should diminish as organic contamination in groundwater decreases, and this expected trend would be confirmed through wetland soil sampling. Once groundwater and leachate concentrations dissipate below cleanup levels, final wetland monitoring activities would be conducted and would include an evaluation of the wetland (which may include conducting a wetland functions and values assessment; visual observation of stained soil, iron staining, and/or stressed vegetation; etc.), as appropriate, to determine if the wetlands have been impacted and to assess what, if any, mitigation efforts may be required to mitigate the impact to the wetlands.

There is the potential for aquifer cross-contamination due to existing monitoring wells screened across significant depths. Therefore, the decommissioning of up to four monitoring wells at the Site is also a component of this alternative.

Institutional controls. Institutional controls are administrative actions that minimize the potential for human exposure by restricting resource usage. Institutional controls would be implemented in the form of the establishment of a State of New Hampshire groundwater management zone (GMZ), under applicable standards, and water use deed restrictions (i.e., limitations on groundwater use as potable water) to prevent ingestion of contaminated groundwater until groundwater cleanup levels have been attained. The GMZ includes a one hundred foot buffer zone that extends beyond the documented extent of groundwater contamination. Attached Figure 2-1 taken the FS Report depicts the proposed GMZ boundary.

Deed restrictions would be required to prevent disturbance of the monitoring well system around the Site.

Institutional controls would also be implemented to require notification if land use development on the 270-acre property is proposed. At this time, EPA does not plan to take remedial actions in the Rockwood Brook wetlands to mitigate future recreational human health risks due to a slightly elevated non-cancer risk to manganese. No current risk to recreational use within the wetland presently exists. The future risk scenario is based on the assumption that portions of the 270-acre property in proximity to the two-acre Site may be developed for residential use bringing more frequent recreational use (hiking, birding, hunting, etc.) to the wetland. Instead, EPA plans to implement an environmental sampling program that includes monitoring wetland soil levels to confirm that manganese levels are declining as expected and requiring notification of land use changes. If the property is proposed for development, the property owner would be required to notify EPA, so that EPA may determine if a human health risk under the proposed development scenario exists. If so, EPA would take appropriate remedial action at that time to eliminate the risk.

Five-Year Reviews. As contaminants will remain on-Site in Site-wide groundwater, five-year reviews would be conducted to evaluate the remedy. Environmental monitoring data would be reviewed to analyze changes in contamination and evaluate if the remedy is progressing. Additional actions may be implemented, if necessary, as a result of these reviews or if regulatory or statutory standards for cleanup change. Additional actions may include implementing one of the other management of migrations alternatives considered in the FS.

GW-2: Monitored Natural Attenuation

Treatment Components	None
Containment Components	Decommissioning up to four existing monitoring wells that are screened across a significant length and create a lateral cross-contamination potential.
Institutional Control Components	• GMZ would delineate area restricted from use for potable water until groundwater cleanup levels are achieved. • Deed restrictions to prevent disturbance of monitoring well system. • Notification of land development will be required to reassess risk to wetland soil.
Monitoring Requirement	• Periodic monitoring of groundwater monitoring wells to assess the effectiveness of natural attenuation processes. • Periodic monitoring of surface water, sediment, leachate, and wetland soils in Rockwood Brook and the adjacent wetlands to evaluate the effect of contaminated groundwater discharge. • Monitoring of land use restrictions to make sure monitoring well system is not disturbed and that there are no changes in land use that may alter risk assumptions.
Operation and Maintenance Requirements	• Review of Site conditions and risks at five year intervals. • O&M of the monitoring well system.
Key ARARs	Safe Drinking Water Act, Clean Water Act, NH Groundwater Protection Standards. See Appendix C of the ROD.
Long-Term Reliability	• Current data indicates that biodegradation of organic groundwater contaminants is actively occurring. • Reliability of institutional controls requires effective oversight and enforcement.
Quantity of Untreated Wastes and/or Residuals	Minimal investigation derived waste from monitoring.
Estimated Time to Design and Construct	6-12 months to install five new monitoring wells and decommission four existing wells.
Estimated Time to Reach Remediation Goals	• Institutional controls would achieve RAO associated with groundwater ingestion in less than 1 year. • PRGs would be achieved in less than 30 years.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Groundwater would be available for drinking water.
Cost	• Capital Cost: $38,361 • O&M Costs: $2,276,273 (NPW) • Periodic Costs: $32,637 (NPW), for 5-year reviews • Total NPW Costs: $2,347,271

NH = New Hampshire.
NPW = Net Present Worth (7% discount rate).

GW-3: MNA with In-Situ Treatment

As noted in the previous alternative, groundwater contaminant biodegradation is shown to be occurring naturally at the Site. However, the RI also found that some of the Site contaminants are not prime candidates for degradation in a short period of time (i.e., metals and some PAHs) . Long-term evaluation of the impacts of other Site actions (e.g., source drum/soils removal and LNAPL collection) has not yet been performed, so it is unclear if those contaminants which are not rapidly degraded will remain at concentrations above PRGs. Under this alternative, MNA would still be established as the primary remedy component. However, additional in-situ treatment technologies would be implemented as appropriate for the various contaminants. Examples of these technologies include chemical oxidation, enhanced biodegradation, and passive-reactive barriers. Each of these are proven technologies, but would require treatability studies to determine if the application is appropriate for the Site configuration and contaminants. Institutional controls would be implemented to protect monitoring wells and treatment systems and to restrict groundwater use as a potable water supply.

The major components of this alternative include pre-remedial study, monitoring well installation, MNA, environmental monitoring, in-situ technologies, institutional controls, and five-year reviews.

Pre-remedial Study. While much of the data needed to design and install the groundwater treatment system is available from the RI, further study would be required to determine appropriate technologies and installation locations of in-situ treatment processes. Bench-scale and pilot-scale testing would be performed to develop an appropriate remedy.

Monitoring Well Installation. Under this alternative, it is assumed that up to five new monitoring wells would be installed to provide further information on contaminant extent and degradation. These wells would be screened in the shallow overburden at an assumed depth of less than 20 feet.

MNA. Under this alternative, MNA would be utilized on those contaminants which would be remediated in a reasonable length of time through natural attenuation processes. The primary contaminants expected to be degraded via MNA include chlorinated VOCs and aromatic VOCs.

Design, Install, and Operate In-situ Treatment System(s). With the multiple source-control measures recently implemented at the Site, selection of the appropriate in-situ technologies cannot be properly done until after further Site-specific evaluations are performed (e.g., pre-remedial studies). For the purposes of this FS, it is assumed that a passive-reactive barrier (PRB) with two media in series will be appropriate for the contaminants which are not readily degraded through MNA. Other in-situ options may be more appropriate for isolated locations. However, through use of multiple media, the PRB can remove most contaminants and is conservative with respect to cost. Depending on contaminant concentrations and aquifer organic loadings, spent media may need to be replaced over time.

Although the length of remedy operation is not clear based on the source controls implemented, 30 years is assumed for costing purposes. Note that modeling performed as part of the RI shows that some contaminants will be reduced to PRGs in less than 30 years, while others could take longer than that. Only further monitoring will be able to determine a better estimate of remediation time.

Environmental Monitoring. Environmental monitoring would be performed in order to evaluate the progress/success of the remedy. Groundwater monitoring would consist of collecting samples from a total of approximately 20 monitoring wells. Surface water, sediment, leachate, and wetland soil samples would also be collected from locations within Rockwood Brook and the adjacent wetland to evaluate the effect of contaminated groundwater discharge on Rockwood Brook and the adjacent wetland. The monitoring would be performed periodically at a frequency to be determined during the remedial design/remedial action phase of Site cleanup. Analytical parameters would likely include VOCs, SVOCs, metals, MNA parameters (i.e., carbon dioxide, methane/ethane/ethane, and volatile fatty acids), and water quality parameters (i.e., alkalinity, chloride, nitrate, nitrite, ortho-phosphate, sulfate, and total organic carbon).

Wetland soil sampling would be conducted to determine if elevated levels of naturally-occurring manganese still persist in the wetland. Manganese is not a known contaminant attributable to wastes disposed of at the Site. However, manganese is often mobilized to groundwater from soils when an aquifer is in a reduced state due to organic contamination. As the wetland is the discharge point for groundwater, dissolved-phase manganese contacting the atmosphere is oxidized and precipitates out in the wetland, accounting for the higher concentration in that area. Manganese concentrations in wetland soils should diminish as organic contamination in groundwater decreases, and this expected trend would be confirmed through wetland soil sampling. Once groundwater and leachate concentrations dissipate below cleanup levels, final wetland monitoring activities would be conducted and would include an evaluation of the wetland (which may include conducting a wetland functions and values assessment; visual observation of stained soil, iron staining, and/or stressed vegetation; etc.), as appropriate, to determine if the wetlands have been impacted and to assess what, if any, mitigation efforts may be required to mitigate the impact to the wetlands.

There is the potential for aquifer cross-contamination due to existing monitoring wells screened across significant depths. Therefore, the decommissioning of up to four monitoring wells at the Site is also a component of this alternative.

Institutional Controls. Institutional controls are administrative actions that minimize the potential for human exposure by restricting resource usage. Institutional controls would be implemented in the form of the establishment of a State of New Hampshire groundwater management zone (GMZ), under applicable standards, and water use deed restrictions (i.e., limitations on groundwater use as potable water) to prevent ingestion of contaminated groundwater until groundwater cleanup levels have been attained. The GMZ includes a one hundred foot buffer zone that extends beyond the documented extent of groundwater contamination. Attached Figure 2-1 taken from the FS Report depicts the proposed GMZ boundary.

Deed restrictions would be required to prevent disturbance of the monitoring well and treatment system around the Site.

Institutional controls would also be implemented to require notification if land use development on the 270-acre property is proposed. At this time, EPA does not plan to take remedial actions in the Rockwood Brook wetlands to mitigate future recreational human health risks due to a slightly elevated non-cancer risk to manganese. No current risk to recreational use within the wetland presently exists. The future risk scenario is based on the assumption that portions of the 270-acre property in proximity to the two-acre Site may be developed for residential use bringing more frequent recreational use (hiking, birding, hunting, etc.) to the wetland. Instead, EPA plans to implement an environmental sampling program that includes monitoring wetland soil levels to confirm that manganese levels are declining as expected and requiring notification of land use changes. If the property is proposed for development, the property owner would be required to notify EPA, so that EPA may determine if a human health risk under the proposed development scenario exists. If so, EPA would take appropriate remedial action at that time to eliminate the risk.

Five-Year Reviews. As contaminants will remain on-site in site-wide groundwater, five-year reviews would be conducted to evaluate the remedy. Environmental monitoring data would be reviewed to analyze changes in contamination and evaluate if the remedy is progressing. Additional actions may be implemented, if necessary, as a result of these reviews or if regulatory or statutory standards for cleanup change. Additional actions may include implementing one of the other management of migration alternatives considered in the FS.

GW-3: MNA with In-Situ Treatment

Treatment Components	In-situ remedy elements such as permeable reactive walls to be determined during pre-remedial studies
Containment Components	• Decommissioning up to four existing monitoring wells that are screened across a significant length and create a lateral cross-contamination potential. • Permeable reactive barrier walls would contain groundwater until it passes through the treatment barriers.
Institutional Control Components	• GMZ would delineate area restricted from use for potable water until groundwater cleanup levels are achieved. • Deed restrictions to prevent disturbance of monitoring wells and treatment system. • Notification of land development will be required to reassess risk to wetland soil.
Monitoring Requirement	• Periodic monitoring of groundwater monitoring wells to assess the effectiveness of natural attenuation and in-situ treatment processes. • Periodic monitoring of surface water, sediment, leachate, and wetland soils in Rockwood Brook and the adjacent wetlands to evaluate the effect of contaminated groundwater discharge.
Operation and Maintenance Requirements	• O&M of monitoring well and treatment system. • Review of Site conditions and risks at five year intervals.
Key ARARs	Safe Drinking Water Act, Clean Water Act, NH Groundwater Protection Standards. See Appendix D of the FS.
Long-Term Reliability	• Current data indicates that biodegradation of organic groundwater contaminants is actively occurring. • In-situ groundwater treatment processes, combined with MNA, are expected to be reliable. • Reliability of institutional controls requires effective oversight and enforcement.
Quantity of Untreated Wastes and/or Residuals	Minimal investigation derived waste from monitoring. Also, waste may be generated from the treatment system.
Estimated Time to Design and Construct	1-2 years
Estimated Time to Reach Remediation Goals	• Institutional controls would achieve RAO associated with groundwater ingestion in less than 1 year. • PRG would be achieved in less than 30 years.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Groundwater would be available for drinking water.
Cost	• Capital Cost: $433,486 • O&M Costs: $2,469,713 (NPW) • Periodic Costs: $38,754 (NPW), for 5-year reviews • Total NPW Costs: $2,941,953

NH = New Hampshire.
NPW = Net Present Worth (7% discount rate).

GW-4: Pump and Treat

Under this alternative, extraction wells and/or subsurface drains would be utilized to capture contaminated groundwater. An on-Site treatment train of standard processes would be developed to attain PRGs and applicable disposal/discharge criteria. The treated groundwater would either be reinjected into the ground, or discharged to Rockwood Brook.

The major components of this alternative include a pre-remedial study; design, installation and operation of the groundwater collection and treatment system; environmental monitoring; institutional controls; and five-year reviews.

Pre-remedial Study. While much of the data needed to design and install the groundwater collection and treatment system is available from the RI, further study would be required to determine appropriate pumping rates and locations. Bench-scale testing would be performed to develop an appropriate treatment system.

Design, Install, and Operate Extraction, Treatment and Discharge System. For the purposes of the FS, it was assumed that fifteen shallow (less than 20-feet deep) extraction wells would be placed at appropriate locations across the Site. Five additional monitoring wells would also be installed to evaluate the remedy. A treatment train consisting of standard processes would be used to treat an assumed flow rate of 20 gallons per minute. For costing purposes, assumed treatment processes include an oil/water separator, precipitation, and UV/chemical oxidation. The pre-remedial study would determine if other processes are more appropriate. Residuals will be transported and disposed of off-Site in accordance with all applicable disposal standards.

Although the length of remedy operation is not clear based on the source controls implemented, 30 years is assumed for costing purposes. Note that modeling performed as part of the RI shows that some contaminants will be reduced to PRGs in less than 30 years, while others could take longer than that. Only further monitoring will be able to determine a better estimate of remediation time.

Environmental Monitoring. Environmental monitoring would be performed in order to evaluate the progress/success of the remedy. Groundwater monitoring would consist of collecting samples from a total of approximately 20 monitoring wells. Surface water, sediment, leachate, and wetland soil samples would also be collected from locations within Rockwood Brook and the adjacent wetland to evaluate the effect of contaminated groundwater discharge on Rockwood Brook and the adjacent wetland. The monitoring would be performed periodically at a frequency to be determined during the remedial design/remedial action phase of Site cleanup. Analytical parameters would likely include VOCs, SVOCs, metals, MNA parameters (i.e., carbon dioxide, methane/ethane/ethane, and volatile fatty acids), and water quality parameters (i.e., alkalinity, chloride, nitrate, nitrite, ortho-phosphate, sulfate, and total organic carbon).

Wetland soil sampling would be conducted to determine if elevated levels of naturally-occurring manganese still persist in the wetland. Manganese is not a known contaminant attributable to wastes disposed of at the Site. However, manganese is often mobilized to

groundwater from soils when an aquifer is in a reduced state due to organic contamination. As the wetland is the discharge point for groundwater, dissolved-phase manganese contacting the atmosphere is oxidized and precipitates out in the wetland, accounting for the higher concentration in that area. Manganese concentrations in wetland soils should diminish as organic contamination in groundwater decreases, and this expected trend would be confirmed through wetland soil sampling. Once groundwater and leachate concentrations dissipate below PRGs, final wetland monitoring activities would be conducted and would include an evaluation of the wetland (which may include conducting a wetland functions and values assessment; visual observation of stained soil, iron staining, and/or stressed vegetation; etc.), as appropriate, to determine if the wetlands have been impacted and to assess what, if any, mitigation efforts may be required to mitigate the impact to the wetlands.

There is the potential for aquifer cross-contamination due to existing monitoring wells screened across significant depths. Therefore, the decommissioning of up to four monitoring wells at the Site is also a component of this alternative.

Institutional Controls. Institutional controls are administrative actions that minimize the potential for human exposure by restricting resource usage. Institutional controls would be implemented in the form of the establishment of a State of New Hampshire groundwater management zone (GMZ), under applicable standards, and water use deed restrictions (i.e., limitations on groundwater use as potable water) to prevent ingestion of contaminated groundwater until groundwater cleanup levels have been attained. The GMZ includes a one hundred foot buffer zone that extends beyond the documented extent of groundwater contamination. Attached Figure 2-1 taken from the FS Report depicts the proposed GMZ boundary.

Deed restrictions would be required to prevent disturbance of the monitoring well and treatment system around the Site.

Institutional controls would also be implemented to require notification if land use development on the 270-acre property is proposed. At this time, EPA does not plan to take remedial actions in the Rockwood Brook wetlands to mitigate future recreational human health risks due to a slightly elevated non-cancer risk to manganese. No current risk to recreational use within the wetland presently exists. The future risk scenario is based on the assumption that portions of the 270-acre property in proximity to the two-acre Site may be developed for residential use bringing more frequent recreational use (hiking, birding, hunting, etc.) to the wetland. Instead, EPA plans to implement an environmental sampling program that includes monitoring wetland soil levels to confirm that manganese levels are declining as expected and requiring notification of land use changes. If the property is proposed for development, the property owner would be required to notify EPA, so that EPA may determine if a human health risk under the proposed development scenario exists. If so, EPA would take appropriate remedial action at that time to eliminate the risk.

Five-Year Reviews. As contaminants will remain on-Site in Site-wide groundwater, five-year reviews would be conducted to evaluate the remedy. Environmental monitoring data would

be reviewed to analyze changes in contamination and evaluate if the remedy is progressing. Additional actions may be implemented, if necessary, as a result of these reviews or if regulatory or statutory standards for cleanup change. Additional actions may include implementing one of the other management of migration alternatives considered in the FS.

GW-4: Pump and Treat

Treatment Components	• A groundwater extraction system consisting of approximately 15 extraction wells, pumps, and piping. • A groundwater treatment system consisting of a standard treatment train (oil/water separator, precipitation, and UV/oxidation) capable of treating 20 gallons per minute. • A treated groundwater discharge system to release treated water to either Rockwood Brook or reinjection wells based on pre-remedial studies.
Containment Components	Decommissioning up to four existing monitoring wells that are screened across a significant length and create a lateral cross-contamination potential.
Institutional Control Components	• GMZ would delineate area restricted from use for potable water until groundwater cleanup levels are achieved • Deed restrictions to prevent disturbance of the treatment/monitoring system • Notification of land development required to reassess risk to wetland soil
Monitoring Requirement	• Periodic monitoring of groundwater monitoring wells to assess the effectiveness of natural attenuation and in-situ treatment processes. • Periodic monitoring of surface water, sediment, leachate, and wetland soils in Rockwood Brook and the adjacent wetlands to evaluate the effect of contaminated groundwater discharge. • Treatment system monitoring
Operation and Maintenance Requirements	• Review of Site conditions and risks at five year intervals • Operation, maintenance, and repair of the groundwater extraction, treatment, and discharge system, as well as the monitoring well system
Key ARARs	Safe Drinking Water Act, Clean Water Act, NH Groundwater Protection Standards, NH Hazardous Waste Regulations, Clean Air Act. See Appendix D of the FS.
Long-Term Reliability	• Groundwater extraction and treatment systems consist of well proven technologies and is expected to be reliable. • Reliability of institutional controls requires effective oversight and enforcement.
Quantity of Untreated Wastes and/or Residuals	Minimal investigation derived waste from monitoring. Also, wastes may be generated from the treatment system.
Estimated Time to Design and Construct	2-3 years
Estimated Time to Reach Remediation Goals	• Institutional controls would achieve RAO associated with groundwater ingestion in less than 1 year. • PRG would be achieved in less than 30 years.
Use of Presumptive Remedies or Innovative Technologies	None
Expected Reuse Outcomes	Groundwater would be available for drinking water.
Cost	• Capital Cost: $1,776,479 • O&M Costs: $4,811,964 (NPW) • Periodic Costs: $52,477 (NPW), for 5-year reviews • Total NPW Costs: $6,640,920

NH = New Hampshire.
NPW = Net Present Worth (7% discount rate).

K. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a final remedy for the Troy Mills Landfill Site. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows:

Threshold Criteria

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP:

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with applicable or relevant and appropriate requirements (ARARs)** addresses whether or not a remedy will meet all Federal environmental and more stringent State environmental and facility siting standards, requirements, criteria or limitations, unless a waiver is invoked.

Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria:

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the Site.

5. **Short term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and Operation Maintenance (O&M) costs, as well as present-worth costs.

Modifying Criteria

The modifying criteria are used as the final evaluation of remedial alternatives, generally after EPA has received public comment on the RI/FS and Proposed Plan:

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis can be found in Tables 5-2 through 5-11 taken from the FS and attached to this ROD.

The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis. Only those alternatives which satisfied the first two threshold criteria were balanced and modified using the remaining seven criteria.

1. Overall Protection of Human Health and the Environment

LNAPL / Leachate Cleanup:

Alternative L-1 would not provide any protection of human health because there would be no action taken to address or monitor the risks posed by the leachate.

Alternatives L-2 and L-3 would achieve cleanup objectives and would be equally protective of human health and the environment in the long term. Alternative L-2 may require more time to achieve leachate cleanup levels and will only address LNAPL, not dissolved contaminants in the leachate. Dissolved contaminant levels are expected to be addressed by source control and natural attenuation processes described under the other components of the remedy. Alternative L-3 may require less time to achieve cleanup levels as it actively extracts and treats contaminated leachate; however, this alternative would require approximately 1-2 years of pre-remedial studies, engineering design effort, and construction before the extraction system would be

operational. These alternatives would also require deed restrictions to prevent the disturbance of remedy components.

Former Drum Disposal Area Cap:

Alternative FDDA-1 would not provide any protection of human health because there would be no action taken to address potential risks posed by the former drum disposal area residual soils, since the existing permeable soil cap would not be maintained and Site conditions would not be monitored.

Alternatives FDDA-2 and FDDA-3 would both achieve cleanup objectives and would be equally protective of human health and the environment in the long term. Both cap alternatives provide a soil cover that prevents dermal contact with underlying residual contaminated soils. Alternative FDDA-2, which allows water to permeate through the existing permeable soil cap, is expected to better facilitate natural attenuation components of the remedy than the impermeable cap to be constructed under alternative FDDA-3. These alternatives will also require institutional controls to prevent activities that would disturb the cap.

Groundwater Cleanup:

Alternative GW-1 would not provide any protection of human health because there would be no action taken to address or monitor the risks posed by groundwater contaminants. There are no unacceptable ecological risks associated with the Site.

Alternatives GW-2, GW-3, and GW-4 all would achieve cleanup objectives and would be equally protective of human health and the environment in the long term. Alternative GW-2 may require the most time to achieve groundwater cleanup levels as it relies solely on natural processes. However, alternatives GW-3 and GW-4 would require approximately 1-3 years of pre-remedial treatability studies, engineering design effort, and construction before the alternatives would be fully implemented. Meanwhile, natural attenuation of contaminants would continue to occur. All three of these alternatives will require institutional controls to prevent the use of contaminated groundwater for drinking water until groundwater cleanup levels have been attained and to prevent the disturbance of monitoring well systems and remedy components until they are no longer needed. These three alternatives would also require that EPA is notified if land use on the 270-acre property changes.

3. Compliance with Applicable or Relevant and Appropriate Environmental Requirements (ARARs)

LNAPL / Leachate Cleanup:

Alternative L-1 would not meet federal/state cleanup requirements for this Site. See Appendix C of this ROD.

Alternative L-2 and L-3 would be designed and implemented to meet all appropriate federal/state cleanup requirements. Alternative L-3 would require compliance with additional requirements that apply to the discharge of treated leachate and groundwater. See Appendix C of this ROD.

Former Drum Disposal Area Cap:

Alternative FDDA-1 would not meet federal/state cleanup requirements for this Site. See Appendix C of this ROD.

Alternative FDDA-2 has already been constructed and it meets all appropriate federal/state cleanup requirements. Alternative FDDA-3 would be designed and implemented to meet all appropriate federal/state cleanup requirements. To remain in compliance over time, both alternatives would implement institutional controls and cap monitoring procedures. See Appendix C of this ROD.

Groundwater Cleanup:

Alternative GW-1 would not meet federal/state cleanup requirements for this Site. See Appendix C of this ROD.

Alternative GW-2 meets all appropriate federal/state cleanup requirements. Alternatives GW-3 and GW-4 would both require pre-remedial engineering design studies, but would be designed and implemented to meet all appropriate federal/state cleanup requirements. Alternative GW-4 would require compliance with additional requirements that apply to the discharge of treated groundwater. See Appendix C of this ROD.

3. Long-Term Effectiveness and Permanence

LNAPL / Leachate Cleanup:

Alternative L-1 does not provide long-term effectiveness or a permanent solution.

Alternatives L-2 and L-3 would provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently reduce LNAPL levels in the leachate to safe levels. Alternative L-3 would also treat dissolved contaminants in the leachate to safe levels.

Former Drum Disposal Area Cap:

Alternative FDDA-1 would not provide long-term effectiveness or permanence.

Alternatives FDDA-2 and FDDA-3 both would provide permanence as each of these alternatives provides a permanent barrier that prevents dermal contact with underlying residual contaminated soils. Institutional controls, regular inspections and cap maintenance would also be implemented as part of alternatives FDDA-2 and FDDA-3 to ensure their long-term

effectiveness. Alternative FDDA-2 is more effective in facilitating the proposed natural attenuation groundwater cleanup alternative as the permeable soil cap allows re-oxygenation and flushing of groundwater to occur.

Groundwater Cleanup:

Alternative GW-1 does not provide long-term effectiveness or a permanent solution.

Alternatives GW-2, GW-3, and GW-4 all would provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently restore groundwater to drinking water cleanup levels in a reasonable timeframe. Each of these alternatives would also utilize institutional controls to prevent the use of groundwater for drinking water until groundwater cleanup levels are achieved.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

LNAPL / Leachate Cleanup:

Alternatives L-1 and L-2 would not reduce contaminant toxicity, mobility, or volume through treatment.

Alternative L-3 would provide for permanent and irreversible reduction in contaminant toxicity, mobility and volume through extraction and treatment of contaminated free floating product and leachate. However, alternative L-3 would require time to complete the necessary treatability studies, engineering design efforts, and construction before this system is operational.

Former Drum Disposal Area Cap:

Alternatives FDDA-1, FDDA-2, and FDDA-3 would not reduce contaminant toxicity, mobility, or volume through treatment.

Groundwater Cleanup:

Alternatives GW-1 and GW-2 would not reduce contaminant toxicity, mobility, or volume through treatment.

Alternative GW-3 and GW-4 rely on treatment technologies to reduce contaminant toxicity, mobility and volume. Alternative GW-3 relies on utilizing in-situ treatment processes, while alternative GW-4 relies on active treatment processes.

5. Short-Term Effectiveness

LNAPL / Leachate Cleanup:

Alternative L-1 would not address LNAPL. As alternative L-1 involves no actions, no short-term impacts would be posed to on-Site workers, the community, or the environment.

Alternatives L-2 and L-3 are expected to remove LNAPL in less than five years. Alternative L-2 would have limited short-term impacts to on-Site workers and the community resulting from periodic monitoring activities. Alternative L-3 would have more short-term impacts to on-Site workers, the community, and the environment from the construction and operation of an extraction and treatment system, along with minor impacts related to periodic monitoring activities.

Former Drum Disposal Area Cap:

Alternative FDDA-1 would not address potential residual soil risks. As alternative FDDA-1 involves no actions, no short-term impacts would be posed to on-Site workers, the community, or the environment.

Alternatives FDDA-2 and FDDA-3 would be expected to mitigate potential direct contact risks to residual soils in less than one year upon completion of the cap and the implementation of institutional controls. However, as alternative FDDA-2 would retain the existing permeable soil cap that was installed by EPA in 2005, it is already preventing potential direct contact risks and would have no additional short-term impacts to on-Site workers, the community, or the environment. Alternative FDDA-3 would have significant short-term impacts to on-Site workers, the community, and the environment from the construction of an impermeable cap.

Groundwater Cleanup:

Alternative GW-1 would not achieve address potential groundwater risks. As alternative GW-1 involves no actions, no short-term impacts would be posed to on-Site workers, the community, or the environment.

Alternatives GW-2, GW-3, and GW-4 are expected to address the RAOs and mitigate potential groundwater risks in less than five years through the implementation of institutional controls. Alternatives GW-2, GW-3, and GW-4 are expected to restore groundwater to safe drinking water less in less than 30 years. Alternative GW-2 would have limited short-term impacts to on-Site workers and the community resulting from periodic monitoring activities. Alternatives GW-3 and GW-4 would have more short-term impacts to on-Site workers, the community, and the environment from the construction and operation of treatment systems, along with impacts related to periodic monitoring activities.

6. Implementability

LNAPL / Leachate Cleanup:

Alternative L-1 is the easiest to implement because no remedial actions are required.

Alternative L-2 is easily implementable as it makes use of the LNAPL interceptor trenches that were installed by EPA in 2003. Alternative L-2 also includes a long-term monitoring program which is easily implementable.

Alternative L-3 is implementable but more complex as it requires the completion of treatability studies, engineering design efforts, and construction before the extraction and treatment system can be operated. Alternative L-3 also includes a long-term monitoring program which is easily implementable.

Former Drum Disposal Area Cap:

Alternative FDDA-1 is the easiest to implement because no remedial actions are required.

Alternative FDDA-2 is easily implementable as it makes use of the permeable soil cap that was installed by EPA in 2005. Alternative FDDA-2 also includes institutional controls which are implementable.

Alternative FDDA-3 is implementable but more complex as it requires constructing an impermeable cap over the former drum disposal area. Additional engineering design effort would be required to determine whether or not the existing permeable soil cap, either partially or wholly, would need to be excavated before constructing the impermeable cap. Construction of an impermeable cap may impact the ability and implementability of the preferred groundwater alternative. Alternative FDDA-3 also includes institutional controls which are implementable.

Groundwater Cleanup:

Alternative GW-1 is the easiest to implement because no remedial actions are required.

Alternative GW-2 is easily implementable as it allows natural attenuation processes to address groundwater contamination. Institutional controls to prevent the use of contaminated groundwater for drinking water until groundwater cleanup levels have been achieved and the implementation of a long-term monitoring program are also implementable.

Alternatives GW-3 and GW-4 are implementable but more complex as they require the completion of treatability studies, engineering design efforts, and construction before the various treatment systems can be operated. Both of these alternatives would also involve the implementation of institutional controls and long-term monitoring programs which are implementable.

7. Cost

LNAPL / Leachate Cleanup:

Alternative L-1 has no capital costs. The only costs are associated with the required five-year reviews. The total present worth cost for alternative L-1 is approximately $12,000.

Alternative L-2 has no capital costs as it would utilize the existing LNAPL/leachate trenches, but would have costs associated with removal and disposal of LNAPL and a long-term monitoring program. The total present worth cost for alternative L-2 is approximately $590,000.

Alternative L-3 would require significant design, construction, and operation costs in addition to costs associated with a long-term monitoring program. The total present worth cost for alternative L-3 is approximately $2.2 million.

Former Drum Disposal Area:

Alternative FDDA-1 has no capital costs. The only costs are associated with the required five-year reviews. The total present worth cost for alternative FDDA-1 is approximately $12,000.

Alternative FDDA-2 has no capital costs as it would utilize the permeable soil cap constructed by EPA in 2005, but would have costs associated with implementing institutional controls and routine inspection and maintenance of the cap. The total present worth cost for alternative FDDA-2 is approximately $70,000.

Alternative FDDA-3 has significant capital costs associated with constructing an impermeable cap in addition to costs associated with implementing institutional controls and routine inspection and maintenance of the cap. The total present worth cost for alternative FDDA-3 is approximately $1.1 million.

Groundwater Cleanup:

Alternative GW-1 has no capital costs. The only costs are associated with the required five-year reviews. The total present worth cost for alternative GW-1 is approximately $12,000.

Alternative GW-2 has no capital costs but would have costs associated with implementing institutional controls and a long-term monitoring program. The total present worth cost for alternative GW-2 is approximately $2.3 million.

Alternatives GW-3 and GW-4 require significant design, construction, and operation costs in addition to costs associated with implementing institutional controls and a long-term monitoring program. The total present worth cost for alternative GW-3 is approximately $2.9 million and the total present worth cost for alternative GW-4 is approximately $6.6 million.

8. State Acceptance

The State of New Hampshire supports the selected remedy which includes monitored natural attenuation to restore groundwater to drinking water standards, implementing institutional controls, and maintaining the existing LNAPL interceptor trenches and permeable soil cap over the former drum disposal area.

A letter from the New Hampshire Department of Environmental Services documenting concurrence on the selected remedy, as presented in this ROD, is attached in Appendix A.

9. Community Acceptance

A complete summary of comments submitted by the general public are contained in the Responsiveness Summary, which is Part 3 of this ROD.

During the public comment period, the community expressed its general support of the selected remedy.

L. THE SELECTED REMEDY

1. Summary of the Rationale for the Selected Remedy

The selected remedy is a comprehensive final remedy which utilizes source control (alternatives L-2 and FDDA-2) and management of migration components (alternative GW-2) to address the principal risks at the Troy Mills Landfill Site.

Source Control

Between July 2004 and the summer of 2005, EPA excavated and removed 7,692 55-gallon drums from the two-acre former drum disposal area as part of a time-critical removal action. In addition, 29,924 gallons of flammable liquid waste, 26,244 tons of heavily contaminated soil, and 3,099 cubic yards of waste sludge were removed from the Site and disposed of off-Site at EPA-approved facilities. Removal and off-Site disposal of the drums, their contents, and heavily contaminated soils represents a significant source control accomplishment which has been incorporated into this final remedy.

Additional source control measures are required to address potential human health risks posed by LNAPL and residual low-level contaminated soils remaining in the former drum disposal area. Continued maintenance of the LNAPL interceptor trenches, installed by EPA's Removal Program in 2003 and operated since then, was selected because the trenches have effectively captured LNAPL to date, makes use of components that are already available and thus are easy to implement, and are expected to achieve remedial action objectives within five years. Institutional controls will also be implemented to restrict activities that could damage the

interceptor trench system. In addition, the selected remedy protects human health and the environment, complies with all ARARs, and will allow for future recreational use of the Site.

Maintenance of the permeable soil cap that was constructed by EPA in July-August 2005 as part of the removal action was also selected as the most effective alternative to address potential direct exposure risks to underlying residual contaminated soils. This alternative was selected because it effectively prevents potential direct exposure risks to underlying soils, makes use of a permeable soil cap that has been already constructed and thus is easy to implement, and facilitates the monitored natural attenuation management of migration remedy for contaminated groundwater, discussed below. Institutional controls will also be implemented to restrict activities that could damage the permeable soil cap. This alternative protects human health and the environment, complies with all ARARs, and will allow for future recreational use of the Site.

Management of Migration

Monitored natural attenuation and institutional controls were selected as the management of migration remedy because it provides, in combination with the completed drum removal source control action, for the restoration of groundwater to drinking water standards, protects human health and the environment, complies with all ARARs, and will allow for the future use of groundwater for drinking water at the Site. With the removal of the primary source of contamination at the Site, this remedy will allow naturally occurring processes to continue reducing contaminant concentrations in groundwater; require monitoring of groundwater, surface water, sediment, leachate, and wetlands to ensure the effectiveness of the remedy; and utilize institutional controls. The institutional controls will require notification of any changes in the use of the 270-acre property on which the Site is located, will restrict the use of contaminated groundwater for drinking water purposes until restoration to drinking water standards is achieved, and restrict activities that would disturb the groundwater monitoring system.

2. Description of Remedial Components

The selected remedy at the Troy Mills Landfill Site includes monitored natural attenuation of groundwater contaminants, the maintenance of a series of LNAPL interceptor trenches, the maintenance of a permeable soil cap, institutional controls, and five-year reviews. Each of the components is described below.

Source Control Alternative L-2 (Maintain LNAPL Interceptor Trenches)

The Site currently has three LNAPL interceptor trenches which were installed by EPA's Removal Program in 2003. They consist of slotted concrete structures placed at the top of the water table. The downgradient sides of the trenches are covered with a geomembrane designed to limit the migration of LNAPL. The trenches capture LNAPL before it discharges with the groundwater along the western edge of the former drum disposal area. The LNAPL is recovered periodically via vacuum extraction or absorbed on sorbent booms. Removal of this contaminant source has improved the water quality of leachate downgradient of the trenches. However, continued maintenance and monitoring is required to confirm that this remedy remains

protective. Disposal of collected LNAPL is included as part of this remedy. Under this alternative, EPA will continue to maintain and operate the existing series of interceptor trenches until LNAPL levels dissipate. Key elements of the LNAPL source control remedy are described below.

- Continued use of the LNAPL interceptor trenches will require the development of a routine maintenance plan and program to ensure that the trenches continue to operate effectively. The routine maintenance plan will outline the steps and timing of activities required to maintain the trenches.

- Disposal characterization sampling data for the LNAPL is available from EPA's removal action. This data will be reviewed, and if necessary, the LNAPL and any associated aqueous phase will be sampled for disposal characterization analysis. This analysis should include testing for VOCs, SVOCs, and metals.

- A routine LNAPL monitoring and extraction plan will be developed to identify the frequency of LNAPL monitoring and extraction. Monitoring and gauging of levels of accumulated LNAPL may occur more frequently at the beginning of remedial action and then become less frequent as less and less LNAPL accumulates within the trenches. The most appropriate method and frequency of extraction of LNAPL will also be evaluated and identified. The methods of LNAPL extraction to be evaluated will include, but are not limited to, active extraction using a vacuum truck and passive extraction using absorbent materials (such as absorbent pad or booms). The method and frequency of LNAPL extraction will likely change over time. At the beginning of the remedial action, more frequent and active methods of LNAPL extraction is likely, becoming less frequent and more passive later in the remedial action.

- At such time as measurable levels of LNAPL no longer accumulate within the interceptor trenches over an extended period of time, the LNAPL interceptor trenches will be kept available for continued monitoring as part of the groundwater component of the remedy. If continued monitoring is no longer necessary, the interceptor trenches will be decommissioned in a manner determined appropriate at that time. Trench decommissioning may involve excavation and physical removal of the trench structures and backfilling the excavation with clean fill or backfilling of the structures with permeable clean fill material, so as not to impede continued groundwater flow in and around the trenches.

- Institutional controls will be implemented to prevent the disturbance of the LNAPL interceptor trench remedy components until they are no longer needed.

Source Control Alternative FDDA-2 (Maintain Permeable Soil Cap)

The two-foot vegetated soil cover installed by EPA's Removal Program in the summer of 2005 will be maintained to prevent direct exposure to the residual underlying soil contaminants while still allowing precipitation to infiltrate across the area. This infiltration is beneficial to the

MNA remedy for groundwater as described below. Institutional controls will be implemented to restrict activities that would result in disturbance of the cap. Key elements of the former drum disposal area source control remedy are described below.

- Precipitation infiltrating to the groundwater through the existing permeable soil cap is expected to re-oxygenate the groundwater. The primary aromatic VOCs at the Site are expected to show improved degradation under aerobic conditions facilitated by the permeable cap. Environmental monitoring conducted as part of the management of migration monitored natural attenuation remedy will evaluate the effectiveness of the permeable cap in facilitating natural attenuation.

- The permeable soil cap is constructed of a geotextile placed over the residual soils, a minimum of 18 inches of sand from a nearby sand quarry, and 6 inches of topsoil which was hydroseeded to establish a vegetative cover that protects the surface of the cap from erosion. In addition, several drainage structures were constructed (riprap drainage swales) to limit cap erosion due to surface runoff. All of the components of the cap will be maintained to preserve the protectiveness of the remedy. Regular inspections will be conducted to document that the cap is properly maintained. If the cap is found to be damaged, corrective action would be taken to repair the cap.

- Institutional controls will be implemented to restrict activities that would result in the disturbance of the permeable soil cap. The institutional controls will consist of a restriction placed on the deed of the property which identifies a surveyed area that is restricted from activities that would disturb the cap. Chain-link gates are located along the access road leading to the Site, and these gates will remain locked and maintained to restrict vehicular access. Through EPA's continued community participation efforts, EPA will also communicate to the public that the permeable soil cap area is restricted. At this time, no signage is planned at the Site.

- In the future, groundwater and leachate PRGs are expected to be achieved. At that time in support of NPL site deletion, a soil boring sampling and analysis program may be conducted to evaluate whether or not the backfilled soils under the permeable soil cap pose a risk to human health and the environment. If the soils are found to continue to pose a risk, even after groundwater PRGs have been achieved, continued groundwater may be required under the capping ARARs identified for the remedy. Analytical data collected during EPA's removal action found no exceedances of State soil screening standards; however, a human health and ecological risk assessment was not performed to quantitatively assess exposure risks from the residual soils as the soils are currently under the two-foot soil cap and not available to exposure under current or reasonably-anticipated future recreational land uses.

Management of Migration Alternative GW-2 (Monitored Natural Attenuation)

Groundwater contaminant biodegradation is shown to be occurring naturally at the Site, and monitored natural attenuation will be established as the primary management of migration

remedy component. Institutional controls will be implemented to restrict groundwater use as a potable water supply until groundwater cleanup levels are achieved and to require notification if land use changes on the property. Environmental monitoring of groundwater and Rockwood Brook surface water, sediment, leachate, and wetland soil will be conducted to determine if contaminant concentrations are being reduced effectively. Key elements of the groundwater management of migration remedy are described below.

- An estimated 39 monitoring wells are located throughout the vicinity of the Troy Mills Landfill Site and the adjacent solid waste landfill. An estimated 20-25 monitoring wells will be included in the long-term groundwater monitoring program required for this remedy, and this number will include up to five new monitoring wells that will be installed to provide further information on contaminant extent and degradation. These wells would be screened in the shallow overburden at an assumed depth of less than 20 feet.

- There are an estimated four existing monitoring wells that are screened across significant depth, and as a result, cross-contamination between shallow and deeper aquifers is a potential. Therefore, these four monitoring wells will be decommissioned as part of management of migration remedy.

- Environmental monitoring will be performed in order to evaluate the progress and success of the groundwater remedy. Groundwater monitoring will consist of collecting samples from a total of approximately 20 monitoring wells from areas both within and outside of contaminated groundwater areas. Groundwater samples will be analyzed for VOCs, SVOCs/PAHs, 1,4-dioxane, metals, water quality parameters (i.e., alkalinity, chloride, nitrate, nitrite, ortho-phosphate, sulfate, and total organic carbon), and geochemical natural attenuation parameters (i.e., methane/ethane/ethane, carbon dioxide, and volatile fatty acids).

  Surface water, sediment, leachate, and wetland soil samples will also be collected from locations within Rockwood Brook and the adjacent wetland to evaluate the effect of contaminated groundwater discharge on Rockwood Brook and its wetland. Surface water samples will be analyzed for VOCs, SVOCs, metals, and water quality parameters. Leachate will be analyzed for VOCs, SVOCs, and metals. Sediment samples will be analyzed for VOCs, SVOCs, and metals. Wetland soil samples will be analyzed for SVOCs and metals.

  The frequency of groundwater, surface water, sediment, leachate, and wetland soil sampling will be determined during initial remedial action efforts. The frequency of sampling may vary from media to media and may vary over the course of the remedial action. Initially, sampling may be more frequent. Later, sampling may be less frequent if sampling data indicates that this is appropriate.

- Environmental sampling of leachate mentioned above will be conducted on a periodic basis to evaluate contaminant concentrations. To confirm that LNAPL-related

contaminants (primarily bis(2-ethylhexyl)phthalate) continue to remain below preliminary remediation goals for the leachate, periodic sampling and analysis of the leachate will be required.

- The wetland soil sampling mentioned above will be conducted primarily to determine if elevated levels of naturally-occurring manganese still persist in the wetland. Manganese is not a known contaminant attributable to wastes disposed of at the Site. However, manganese is often mobilized to groundwater from soils when an aquifer is in a reduced state due to organic contamination. As the wetland is the discharge point for the groundwater, the dissolved-phase manganese contacting the atmosphere is oxidized and precipitates out in the wetland, accounting for the higher concentration in that area. Manganese concentrations in wetland soils should diminish as organic contamination in groundwater decreases, and this expected trend will be confirmed through wetland soil sampling.

- Once groundwater and leachate concentrations dissipate below PRGs, final wetland monitoring activities will be conducted and will include an evaluation of the wetland (which may include conducting a wetland functions and values assessment; visual observation of stained soil, iron staining, and/or stressed vegetation; etc.), as appropriate, to determine if the wetlands have been impacted and to assess what, if any, mitigation efforts may be required to mitigate the impact to the wetlands.

- Institutional controls will be implemented in the form of the establishment of a State of New Hampshire groundwater management zone (GMZ), under applicable standards, and water use deed restrictions (i.e., limitations on groundwater use as potable water) to prevent exposure to contaminated groundwater until groundwater has been restored to drinking water standards. The GMZ includes a minimum one hundred foot buffer zone that extends beyond the documented extent of groundwater contamination. Attached Figure 2-1 taken the FS Report depicts the proposed GMZ.

- Institutional controls will also be implemented to require notification if land use development on the 270-acre property is proposed. At this time, EPA does not plan to take remedial actions in the Rockwood Brook wetlands to mitigate future recreational human health risks to manganese. No current risk to recreational use within the wetland exists. The future risk scenario is based on the assumption that portions of the 270-acre property in proximity to the two-acre Site may be developed for residential use bringing more frequent recreational use (hiking, birding, hunting, etc.) to the wetland. Instead, EPA plans to implement an environmental sampling program that includes monitoring wetland soil levels to confirm that manganese levels are declining as expected and requiring notification of land use changes. If the property is proposed for development, the property owner will be required to notify EPA, so that EPA may determine if a human health risk under the proposed development scenario exists. If so, EPA would take appropriate remedial action at that time to eliminate the risk. At such time that wetland monitoring documents that manganese levels in Rockwood

Brook wetland soils no longer poses a potential future risk, the notification requirement will cease.

- When groundwater PRGs are achieved and groundwater monitoring is no longer required, the need for the continued presence of on-Site monitoring wells will be evaluated. If the monitoring wells are determined to be no longer required, they will be decommissioned in an appropriate manner. Note that some monitoring wells would need to be retained if groundwater monitoring requirements for the permeable soil cap over the former drum disposal area were still in effect.

- Institutional controls will be implemented to prevent the disturbance of the groundwater monitoring well system until it is no longer needed.

Five-Year Reviews

As required by law, EPA will review the remedy at least once every five years after the initiation of remedial action at the Site since hazardous substances will remain at the Site. The five-year reviews will be conducted to assure that the remedial action continues to protect human health and the environment. Additional actions may be implemented, if necessary, as a result of these reviews or if regulatory or statutory standards change. EPA will also review the Site prior to the anticipated eventual deletion from the National Priorities List, which essentially ends Superfund involvement at the Site.

Any changes to the remedy described in this Record of Decision will be documented in a technical memorandum in the Administrative Record for the Site, an Explanation of Significant Differences (ESD) or a Record of Decision Amendment, as appropriate.

3. Summary of the Estimated Remedy Costs

The following tables summarize the major capital and annual costs for the overall remedy (alternatives L-2, FDDA-2, and GW-2). The information in the cost estimate summary tables are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected over time. Major changes may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost. For a detailed description of the assumptions and components used to estimate the selected remedy costs, refer to Appendix B of the FS Report.

L-2 Cost Summary

Description		Cost	Notes
Capital Costs	Institutional Control	$7,500	
	Contingency	$1,500	20% scope contingency
	Technical Support and Project Management	$1,800	10% of costs
Annual Operations and Maintenance Costs	LNAPL Interceptor Trench Maintenance	$92,000/yr	Assumes 5 years until RAOs and PRGs are achieved
	Environmental Monitoring	$11,560/yr	
	Contingency	$20,712/yr	10% bid and 10% scope contingency
	Technical Support and Project Management	$12,428/yr	5% of non-contingency costs
Periodic Costs	Five-year review	$5,000	Cost for one five-year review
	Trench decommissioning	$14,800	
Total Net Present Worth Cost		**$587,503**	7% discount rate and a 5-year time frame

FDDA-2 Cost Summary

Description		Cost	Notes
Capital Costs	Institutional Control	$7,500	
	Contingency	$1,500	20% scope contingency
	Technical Support and Project Management	$1,800	10% of costs
Annual Operations and Maintenance Costs	Cap Monitoring and Maintenance	$1,500/yr	Assumes 5 years until RAOs and PRGs are achieved
	Contingency	$300/yr	20% contingency
	Technical Support and Project Management	$2,000/yr	
Periodic Costs	Five-year review	$30,000	
Total Net Present Worth Cost		**$70,320**	7% discount rate and a 30-year time frame

GW-2 Cost Summary

Description		Cost	Notes
Capital Costs	Monitoring well installation	$11,640	Five new wells
	Monitoring well decommission	$4,896	Four wells to be decommissioned
	Institutional controls	$7,500	
	Contingency	$4,807	10% bid and 10% scope contingency
	Project Management, Remedial Design, and Construction Management	$9,518	8%, 15%, and 10%, respectively, of costs
Annual Operations and Maintenance Costs	Groundwater sampling and analysis	$96,213/yr	Assumes 20 wells for 30 years. Quarterly for 2 years, then semi-annually.
	Surface water sampling and analysis	$9,760/yr	Assumes 4 locations (including 1 leachate), semi-annually for 30 years.
	Sediment sampling and analysis	$8,040/yr	Assumes 3 locations, semi-annually for 30 years.
	Wetland soil sampling and analysis	$3,660/yr	Assumes 3 locations, semi-annually for 30 years.
	Contingency	$35,302	30% contingency allowance
	Technical Support and Project Management	$30,595	15% for data validation and 5%, respectively, on non-contingency costs
Periodic Costs	Five-year reviews	$30,000	
	Monitoring well decommission	$48,960	
Total Net Present Worth Cost		**$2,347,271**	7% discount rate and a 30-year time frame

The estimated net present worth of the selected remedy is $3.0 million.

4. Expected Outcomes of the Selected Remedy

The primary expected outcome of the selected remedy is that the entire two-acre Site and impacted downgradient areas will no longer present an unacceptable risk to future recreational users and will be suitable for recreational use. Approximately five years are estimated as the amount of time necessary to achieve the goals consistent with recreational use. Another expected outcome of the selected remedy is that groundwater at the Site will not present an unacceptable risk to future nearby residents and will be suitable for consumption. Approximately 30 years are estimated as the amount of time necessary to achieve the this outcome consistent with consumption of groundwater for drinking water.

The selected remedy will also provide environmental and ecological benefits such as the protection of wildlife within Rockwood Brook and the improvement of surface water, sediment, and wetland soil quality within the brook. It is anticipated that the selected remedy will also provide socio-economic and community revitalization impacts such as increased property values to the Site and neighboring properties and enhanced human uses of ecological resources.

5. Cleanup Level

Interim Groundwater Cleanup Levels

Interim cleanup levels have been established in groundwater for all chemicals of concern identified in the human health risk assessment found to pose an unacceptable risk to public health or are in exceedances of an ARAR. No significant ecological risks were identified for the Site. Interim cleanup levels have been set based on the ARARs (e.g., MCLs, and more stringent State groundwater remediation standards) as available, or other suitable criteria described below. Periodic assessments of the protection afforded by remedial actions will be made as the remedy is being implemented and at the completion of the remedial action. At the time that both the Interim Groundwater Cleanup Levels identified in the ROD and newly promulgated ARARs and/or modified ARARs have been achieved, and have not been exceeded for a period of three consecutive years, a risk assessment shall be performed on all residual groundwater contamination to determine whether the remedial action is protective. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative carcinogenic and non-carcinogenic risks posed by all chemicals of concern identified in the ROD (including but not limited to the chemicals of concern) via residential use of groundwater. If, after review of the risk assessment, the remedial action is not determined to be protective by EPA, the remedial action shall continue until either: 1) all protective levels are achieved, and are not exceeded for a period of three consecutive years, or 2) until the remedy is otherwise deemed protective or is modified. These protective residual levels shall constitute the final cleanup levels for this ROD and shall be considered performance standards for this remedial action.

NHDES completed a Groundwater Use and Value Determination on groundwater at the Site. This determination is attached as Appendix E. This finding indicates that the groundwater beneath the Site has medium value as a future drinking water supply based primarily on the low yield of the underlying overburden and bedrock aquifers and the moderate likelihood of future drinking water use in the area, and therefore drinking water standards, consistent with the use and value determination, shall be attained in the groundwater at the Site.

Interim cleanup levels for known, probable, and possible carcinogenic chemicals of concern (Classes A, B, and C) and for chemicals with potential noncarcinogenic effects, have been established to protect against potential carcinogenic effects and to conform with ARARs. Maximum Contaminant Levels (MCLs), non-zero MCLGs, or State standards if more stringent, are used to set interim cleanup levels. In the absence of an MCL, non-zero MCLG, or State standard, other suitable criteria (i.e., health advisory, state guidelines) are used to set interim cleanup levels.

If a value described by any of the above methods was not capable of being detected with good precision and accuracy, then the practical quantification limit was used, as appropriate, for the Interim Groundwater Cleanup Level.

Table L-1 summarizes the Interim Cleanup Levels for carcinogenic and non-carcinogenic

chemicals of concern identified in groundwater.

Table L-1

Interim Groundwater Cleanup Levels

Carcinogenic Chemical of Concern	Cancer Classification	Interim Cleanup Level (ug/L)	Basis	RME Risk
1,4-Dioxane	B2	3	GW-1	1E-06
Benzene	A	5	MCL	7E-06
Tetrachloroethene	not available*	5	MCL	7E-05
Trichloroethene	B1*	5	MCL	6E-05
Vinyl Chloride	A	2	MCL	2E-04
Benzo(a)pyrene	B2	0.2	MCL	3E-05
Benzo(b)fluoranthene	B2	0.05	AGQS	6E-07
bis(2-Ethylhexyl)phthalate	B2	6	MCL	3E-06
Dibenzo(a,h)anthracene	B2	0.01	PQL	1E-06
Pentachlorophenol	B2	1	MCL	2E-06
Arsenic	A	10	MCL	3E-04
Non-Carcinogenic Chemical of Concern	**Target Endpoint**	**Interim Cleanup Level (ug/L)**	**Basis**	**RME Hazard Quotient**
1,2,4-Trimethylbenzene	General Toxicity/ Liver/Kidney	50	AGQS	1
1,3,5-Trimethylbenzene	General Toxicity/ Liver/Kidney	50	AGQS	1
2-Butanone	Developmental	170	AGQS	0.03
4-Isopropyltoluene	Kidney	50	AGQS	0.1
Benzene	Immune System	5	MCL	0.2
cis-1,2-Dichloroethene	Blood	70	MCL	0.7
n-Butylbenzene	Blood	50	AGQS	5
n-Propylbenzene	Blood	50	AGQS	4
Tetrachloroethene	Liver	5	MCL	0.07
Tetrahydrofuran	not available	154	AGQS	Not available
Toluene	Liver/Kidney	1,000	MCL	1
Trichloroethene	Liver	5	MCL	0.02
Vinyl Chloride	Liver	2	MCL	0.07
bis(2-Ethylhexyl)phthalate	Liver	6	MCL	0.06
Naphthalene	General Toxicity	20	AGQS	0.8
Pentachlorophenol	Liver/Kidney	1	MCL	0.003
Arsenic	Skin	10	MCL	3
Boron	Developmental	620	AGQS	0.3
Manganese	CNS	300	Advisory	1

Key

AGQS – New Hampshire Ambient Groundwater Quality Standards - 2/24/99.

ug/L = micrograms per liter (equivalent to parts per billion).

* = The cancer classifications for tetrachloroethene and trichloroethene are under review by EPA.

GW-1 = New Hampshire Department of Environmental Services Method 1 Groundwater Standards (RCMP, 3/31/05). Note that recent updates have been made to the NHDES GW-1 standards. It is anticipated that the AGQS concentrations presented will be made equivalent to the GW-1 standards. However, GW-1 standards have only been selected as the PRG when there is no AGQS available.

The AGQS for dibenzo(a,h)anthracene is 0.005 ug/L; however the interim groundwater cleanup levels has been set at 0.01 ug/L based on the practical quantification limit (PQL) for this chemical. During five-year reviews, the PQL for this chemical will be revisited to determine if analytical detection limits in the range of the AGQS are achievable. If so, the interim groundwater cleanup level for this chemical will be revised to match the AGQS.

Table L-1

Interim Groundwater Cleanup Levels

Tetrahydrofuran was included on the above table as it was found in groundwater at levels that exceed an AGQS. However, as an RfD was not available, an RME hazard quotient could not be calculated.
MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal
Advisory = Health Advisory on Manganese (EPA-822-R-04-003; January 2004).
CNS = Central Nervous System.
PQL = Practical Quantification Limit.

As noted above, at the time that Interim Groundwater Cleanup Levels identified in the ROD, newly promulgated ARARs, and modified ARARs, which require higher standards for the remedy to remain protective have been achieved, a risk assessment shall be performed on the residual groundwater contamination to determine whether the remedy is protective at the points of compliance. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative carcinogenic and non-carcinogenic risks posed by ingestion and dermal absorption of groundwater and inhalation of VOCs from domestic water usage. At this Site, Interim Cleanup Levels must be met throughout the contaminated groundwater plume that extends from the former drum disposal area west-northwest into the adjacent Rockwood Brook wetland area. Compliance will be demonstrated by attainment of interim cleanup levels, or alternative protective levels as determined above, in all monitoring wells and area supply wells currently associated with the Site plume. EPA has estimated that the Interim Groundwater Cleanup Levels will be reached within 30 years after completion of the source control component.

Leachate Cleanup Levels

Without the maintenance of the LNAPL interceptor trenches at the Site, leachate migrating from the Site contains levels of contaminants that pose a potential future risk to young child and/or adult recreational users at the Site. Leachate PRGs based on RME human health risks were established. Risk estimates were calculated based on existing data and exposure parameters contained in the RI, FS, and risk assessment reports. Cleanup levels for chemicals of concern in leachate exhibiting an unacceptable cancer risk and/or hazard index have been have been established such that they are protective of human health. Leachate cleanup levels for known and suspect carcinogenic chemicals of concern (Classes A, B, and C compounds) have been set at a 10-6 excess cancer risk level considering exposures via dermal contact. Cleanup levels for chemicals of concern in leachate having non-carcinogenic effects were derived for the same exposure pathway(s) and correspond to an acceptable exposure level to which the human population (including sensitive subgroups) may be exposed without adverse affect during a lifetime or part of a lifetime, incorporating an adequate margin of safety (hazard quotient = 1).

Table L-2 summarizes the cleanup levels for carcinogenic and non-carcinogenic chemicals of concern in LNAPL-contaminated leachate protective of direct contact.

Table L-2

Leachate Cleanup Levels for the Protection of Recreational Dermal Contact Exposures

Carcinogenic Chemical of Concern	Cancer Classification	Interim Cleanup Level (ug/L)	Basis	RME Risk
bis(2-Ethylhexyl)phthalate	B2	40	Risk	1E-06
Non-Carcinogenic Chemical of Concern	**Target Endpoint**	**Interim Cleanup Level (u/L)**	**Basis**	**RME Hazard Quotient**
bis(2-Ethylhexyl)phthalate	Liver	40	Risk	0.01

Key
HQ = Hazard Quotient.
ug/L = micrograms per liter (equivalent to parts per billion).

These leachate cleanup levels must be met at the completion of the remedial action at the point of compliance generally described as where leachate enters the adjacent Rockwood Brook wetlands. In addition, the leachate levels must be met without the maintenance of the LNAPL interceptor trenches. If the trenches must be maintained in order for cleanup levels to be met, this will not be considered compliance. The cleanup levels are consistent with ARARs for the leachate, attain EPA's risk management goals for remedial action, and are protective of human health.

M. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Troy Mills Landfill Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, will comply with ARARs and is cost effective. In addition, the selected remedy utilizes permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Based on the recent completion of a drum removal action by EPA's Removal Program, which eliminated the primary source of Site contamination; the remote location of the Site; the lack of current human health risks; and the relatively low levels of remaining contamination present, EPA concluded that it was impracticable to remove and treat the chemicals of concern in a cost-effective manner at the Site. Thus, the selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy.

1. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will adequately protect human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through treatment, engineering controls and institutional controls. More specifically, the remedy will: 1) restore groundwater to drinking water standards through monitored natural attenuation;

2) eliminate LNAPL and reduce contaminant levels in leachate through the continued capture of LNAPL in a series of interceptor trenches, with off-Site disposal; 3) prevent direct contact with residual contaminated soils in the former drum disposal area through the continued maintenance of the existing permeable soil cap; and 4) and utilize institutional controls to prevent the use of groundwater for drinking water until it is restored, prevent activities that would disturb the remedy, and prevent activities that would disturb remedy components until they are no longer needed.

No ecological risks were identified at the Site. The selected remedy will reduce potential human health risk levels such that they do not present an unacceptable incremental carcinogenic risk and such that the non-carcinogenic hazard is below a level of concern. It will reduce potential human health risk levels to protective ARARs levels, (i.e., the remedy will comply with ARARs and To Be Considered criteria). Implementation of the selected remedy will not pose any unacceptable short-term risks or cause any cross-media impacts.

2. The Selected Remedy Complies With ARARs

The selected remedy will comply with all federal and any more stringent state ARARs that pertain to the Site. This section briefly summarizes the most significant chemical-, location- and action-specific ARARs for the remedy. Appendix C of this ROD summarizes the various environmental statutes and regulations discussed below, as well as their impact on remedial activities. A list of the federal and state chemical-, location-, and action-specific ARARs associated with the selected remedy follow at the end of this section.

Chemical-Specific ARARs

Chemical-specific ARARs govern the extent of cleanup and provide either actual clean-up levels or a basis for calculating such levels. These requirements are usually health or risk based numerical values or methodologies which, when applied to Site-specific conditions, result in numerical values which help define the degree of cleanup. See Appendix C, Table C-1.

The federal Safe Drinking Water Act MCLs and New Hampshire Ambient Groundwater Quality Standards are relevant and appropriate because they set the levels for groundwater cleanup to restore the groundwater to drinkable status at the Site. In addition, EPA Cancer Slope Factors (CSFs) and EPA Risk Reference Dose (RfDs) were considered in the establishment of human health risks posed by the groundwater contaminants and LNAPL-contaminated leachate. The selected groundwater management of migration and LNAPL source control alternatives will meet all of the chemical-specific cleanup levels over time.

In the future, EPA CSFs and RfDs would be used to calculate the human health risks potentially posed by the backfilled soil within the former drum disposal area. To support eliminating the need for the permeable soil cap and potential NPL site deletion, additional sampling would be conducted, with the results compared to the above values to calculate human health risks.

Location-Specific ARARs

Location-specific ARARs are restrictions relating more directly to the geographical or physical setting or position of a site. They are generally restrictions on the conduct of activities solely because of a site's particular characteristics or location. The selected cleanup at the Site occurs along the western bank of Rockwood Brook, which includes a wetland and floodplain area. See Appendix C, Table C-2.

Applicable location-specific ARARs pertain to wetland and floodplain resources in the vicinity of the LNAPL interceptor trench system that may be affected by trench monitoring and environmental sampling activities. Applicable location-specific ARARs for monitored natural attenuation pertain to wetland and floodplain resources within the area of the contaminated groundwater plume that may be affected by monitoring well installation, monitoring well maintenance, and environmental sampling activities.

Additional regulations are applicable and require the EPA to consult with appropriate agencies when activities may affect jurisdictional domains. EPA has provided formal notice to the U.S. Fish and Wildlife Service, the National Oceanic and Aquatic Administration, and NHDES and will continue to consult with these agencies during remediation activities.

Action-Specific ARARs

Action-specific ARARs are usually technology- or activity-based limitation or requirements that control actions at CERCLA sites. These requirements generally define acceptable treatment, storage and disposal procedures for hazardous substances and solid waste during the response action. See Appendix C, Table C-3.

Since the interceptor trench is already constructed, action-specific ARARs for the LNAPL interceptor trench include RCRA (New Hampshire has been delegated the authority to administer RCRA standards through its State hazardous waste management regulations); non-delegated RCRA standards pertaining to air emissions from process vents and equipment leaks; the Clean Air Act; and State standards prohibiting LNAPL from being discharged to groundwater; State hazardous waste testing, handling, storage and disposal regulations that address the remediation of LNAPL or other remediation waste generated; and State air standards.

Action-specific ARARs for the already constructed permeable soil cap over the former drum disposal area include EPA guidances for landfill closure; RCRA for any hazardous wastes generated by monitoring activities; the Clean Water Act for surface water and sediment monitoring standards; relevant and appropriate State solid waste standards pertaining to closure, post-closure, and monitoring (requirements calling for landfill impermeable cover requirements are not relevant and appropriate since the remedy's permeable cover is a component of the groundwater natural attenuation component of the remedy); State groundwater protection standards; State hazardous waste standards for testing, handling, and disposal of monitoring wastes; State well standards; State terrain alteration regulations; and State dust control standards.

Action-specific ARARs for the groundwater management of migration remedy include State of New Hampshire Groundwater Management Zone regulations that address the establishment of a groundwater management zone; federal Clean Water Act Ambient Water Quality Criteria and State of New Hampshire Surface Water Quality Standards for the establishment of standards for evaluating the success of the natural attenuation process; and State groundwater monitoring wells regulations for surface and groundwater monitoring, well installation, operation, and closure. In addition, there are applicable federal and state standards for hazardous waste testing and handling for any monitoring waste generated. EPA guidance on the use of monitored natural attenuation remedies was also cited as a To Be Considered standard.

The selected remedy will comply with the following federal ARARs

- RCRA - Hazardous Waste Facility Requirements (40 CFR Part 264) – adopted under delegated NH hazardous waste regulations
- RCRA - Hazardous Waste Identification and Listing (40 CFR Part 261) – adopted under delegated NH hazardous waste regulations
- RCRA - Hazardous Waste Generator Requirements (40 CFR Part 262) – adopted under delegated NH hazardous waste regulations
- RCRA Air Emissions Standards (40 CFR 264, Subpart AA and BB)
- CAA - National Emission Standards for Hazardous Waste Pollutants (NESHAPS) (40 CFR Part 61)
- CWA - Ambient Water Quality Criteria (40 CFR 122.44)
- SDWA - Maximum Contaminant Levels (40 CFR 141.11 - 141.16)
- Protection of Floodplains (Executive Order 11988)
- Protection of Wetlands (Executive Order 11990)
- Fish and Wildlife Coordination Act (16 USC 661)

In addition, the selected remedy will comply with the following more stringent state ARARs:

- New Hampshire Ambient Groundwater Quality Standards (Env-Ws 316, 317, 319)
- New Hampshire Criteria and Conditions for Dredge and Fill in Wetlands (Env-Wt 300)
- New Hampshire Hazardous Waste Identification and Listing Rules (Env-Wm 403.6)
- New Hampshire Hazardous Waste Generators Rules (Env-Wm 500)
- New Hampshire Hazardous Waste Facility Owner and Operator Rules (Env-Wm 700)
- New Hampshire Reporting and Remediation of Oil Discharges Rules (Env-Wm 1600)
- New Hampshire Air Pollution Rules (Env-A 100 - 3800)
- New Hampshire Ambient Air Quality Standards (Env-A 300)
- New Hampshire Regulated Air Toxic Pollutants Rules (Env-A 1400)
- New Hampshire Well Abandonment of Well Rules (We 604)
- New Hampshire Groundwater Management and Groundwater Release Detection Permit Rules (Env-Wm 1403.03-1403.50)
- New Hampshire Protection of State Surface Water Regulations (Env-Ws 401 - 405)
- New Hampshire Surface Water Quality Regulations (Env-Ws 1700)

- New Hampshire Groundwater Monitoring Well Rules (Env-Ws 1403.27)
- New Hampshire Terrain Alteration Rules (Env-Ws 415)
- New Hampshire Fugitive Dust Control Rules (Env-A Part 1002)

The following policies, advisories, criteria, and guidances will also be considered during the implementation of the remedial action:

- EPA Reference Doses (RfDs)
- EPA Health Assessment Carcinogenicity Slope Factors (CSFs)
- EPA Guidance on Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites.
- EPA Guidance on Risk-Based Clean Closure
- EPA Guidance on Presumptive Remedy for CERCLA Municipal Landfill Sites
- EPA Region 1 - Guidance on Groundwater Use and Value Determination
- EPA Health Advisories, Human Health Risk Assessment Guidance and Ecological Risk Assessment Guidance

3. The Selected Remedy is Cost-Effective

In the Lead Agency's judgment, the selected remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR 300.430(f)(1)(ii)(D)). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and comply with all federal and any more stringent State ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria -- long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative then was compared to the alternative's costs to determine cost-effectiveness. The relationship of the overall effectiveness of the selected remedy was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

The net present worth of the selected remedy is $3.0 million.

With regard to the LNAPL source control alternatives, alternative L-1 did not meet the threshold criteria and was dismissed from further consideration. Selected alternative L-2 is less expensive (approximately $590,000) than alternative L-3 ($2.2 million), and it achieves the RAOs in less time as it does not require the additional 1-2 years of design, engineering, and construction effort that alternative L-3 would need before it is operational.

With regard to the former drum disposal area source control alternatives, alternative FDDA-1 did not meet the threshold criteria and was dismissed from further consideration. Selected alternative FDDA-2 is less expensive (approximately $70,000) than alternative FDDA-3 ($1.1 million), and it achieves the RAOs in less time, since it is already constructed and therefore does not require the additional 1-2 years of design, engineering, and construction effort that

alternative FDDA-3 requires before it would be constructed. Alternative FDDA-2 also facilitates the groundwater natural attenuation component of the selected remedy.

With regard to the groundwater management of migration alternatives, alternative GW-1 failed to meet the threshold criteria and was dismissed from further consideration. Selected alternative GW-2 is less expensive ($2.3 million) than alternatives GW-3 ($2.9 million) and GW-4 ($6.6 million). Groundwater RAOs will be met for alternatives GW-2, GW-3, and GW-4 in the same amount of time (less than one year) through the use of institutional controls to restrict the use of Site groundwater for drinking water purposes. The remediation time for alternatives GW-3 and GW-4 to restore groundwater to drinking water levels are assumed to be less than alternative GW-2; however, alternatives GW-3 and GW-4 will both require 2-3 years of design, engineering, and construction effort before they could be operational. In the meantime, natural attenuation will continue to reduce groundwater contaminant levels. It is estimated that the potential time savings of alternatives GW-3 and GW-4 over alternative GW-2 are minimal and not justified given the additional costs. The estimated length of remedy operation for GW-2, GW-3 and GW-4 assumed to be 30 years for costing purposes. Only further monitoring will be able to determine a better estimate of remediation time.

4. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Once the Agency identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, EPA identified which alternatives utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness; 4) implementability; and 5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-Site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives as described below:

Long-Term Effectiveness and Permanence

With regard to the LNAPL source control alternatives, alternatives L-2 and L-3 will provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently remove LNAPL from the groundwater and prevent contamination of leachate discharging into the wetlands. Selected alternative L-2 makes use of the existing LNAPL interceptor trenches to capture and remove LNAPL from the Site. Alternative L-3 calls for the design, construction, and operation of an LNAPL collection and treatment system.

With regard to the former drum disposal area soil alternatives, alternatives FDDA-2 and FDDA-3 both will provide permanence as each of these alternatives provides a permanent barrier that prevents dermal contact with underlying residual contaminated soils. Institutional controls, regular inspections and cap maintenance would also be implemented as part of alternatives FDDA-2 and FDDA-3 to ensure their long-term effectiveness. However, selected alternative FDDA-2 is more effective in facilitating the selected groundwater natural attenuation alternative as the permeable cap allows re-oxygenation and flushing of groundwater to occur.

With regard to groundwater management of migration alternatives, alternatives GW-2, GW-3, and GW-4 all will provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently restore groundwater to drinking water cleanup levels in a reasonable timeframe. However, selected alternative GW-2 will provide a permanent solution for considerably less cost. Each of these alternatives would also utilize institutional controls to prevent the use of groundwater for drinking water until cleanup levels are achieved.

Reduction of Toxicity, Mobility or Volume Through Treatment

With regard to the LNAPL source control alternatives, selected alternative L-2 does not reduce contaminant toxicity, mobility, or volume through treatment. Selected alternative L-2 will utilize the existing LNAPL interceptor trenches to capture LNAPL for off-Site disposal. Depending on the selected disposal facility, the recovered LNAPL may be treated, but treatment is not the primary component of this alternative. Alternative L-3 would provide for permanent and irreversible reduction in contaminant toxicity, mobility and volume through extraction and treatment of contaminated free floating product. However, alternative L-3 would require time to complete the necessary treatability studies, engineering design efforts, and construction before the LNAPL extraction and treatment system is operational. In the time required to design and build the system, selected alternative L-2 may effectively capture the recoverable amount of LNAPL at the Site, potentially rendering alternative L-3 unnecessary.

With regard to the former drum disposal area soil source control alternatives, alternatives FDDA-2 and FDDA-3 do not reduce contaminant toxicity, mobility, or volume through treatment. Based on the recent completion of a drum removal action by EPA's Removal Program, which eliminated the source on ongoing contamination; the remote location of the Site; the lack of current human health risks; and the relatively low levels of contamination present, EPA concluded that it was impracticable to excavate and treat the chemicals of concern in a cost-effective manner.

With regard to groundwater management of migration alternatives, selected alternative GW-2 does not reduce contaminant toxicity, mobility, or volume through treatment. Alternative GW-3 and GW-4 rely on treatment technologies to reduce contaminant toxicity, mobility and volume. Alternative GW-3 relies on utilizing in-situ treatment processes, while alternative GW-4 relies on active treatment processes. However, both GW-4 and GW-4 would require 1-3 years of engineering, design, and construction effort before they would be operational. In that time, selected alternative GW-2 may significantly reduce contaminant concentrations to levels that would render alternatives GW-3 and GW-4 unnecessary.

Short Term Effectiveness

With regard to the LNAPL source control alternatives, alternatives L-2 and L-3 are expected to remove all LNAPL from Site groundwater in less than five years. Selected alternative L-2 makes use of the existing LNAPL interceptor trenches, and therefore, only limited short-term impacts to on-Site workers, the environment, and the community would result, primarily from periodic monitoring and LNAPL removal activities that will be required. Alternative L-3 would have more significant short-term impacts to on-Site workers, the community, and the environment from the construction and operation of an extraction and treatment system, along with minor impacts related to periodic monitoring activities.

With regard to the former drum disposal area soil source control alternatives, alternatives FDDA-2 and FDDA-3 would be expected to mitigate potential direct contact risks to residual soils in less than one year upon completion of the cap and the implementation of institutional controls. However, as selected alternative FDDA-2 would retain the existing permeable soil cap that was constructed by EPA in 2005, this alternative is already preventing potential direct contact risks and would have no additional short-term impacts to on-Site workers, the community, or the environment. Alternative FDDA-3 would have significant short-term impacts to on-Site workers, the community, and the environment from the construction of an impermeable cap.

With regard to the groundwater management of migration alternatives, alternatives GW-2, GW-3 and GW-4 are expected to mitigate potential groundwater risks in the short term (i.e., less than five years). However, selected alternative GW-2 would have only limited short-term impacts to on-Site workers and the community resulting from periodic monitoring activities. Alternatives GW-3 and GW-4 would have more significant short-term impacts to on-Site workers, the community, and the environment from the construction and operation of treatment systems, along with impacts related to periodic monitoring activities.

Implementability

With regard to the LNAPL source control alternatives, selected alternative L-2 is easily implemented as it makes use of the LNAPL interceptor trenches that were installed by EPA in 2003. Alternative L-3 is implementable but more complex as it requires the completion of treatability studies, engineering design efforts, and construction before the extraction and treatment system can be operated. Alternatives L-2 and L-3 also include a long-term monitoring program which is easily implementable.

With regard to the former drum disposal area soils source control alternatives, selected alternative FDDA-2 is easily implemented as it makes use of the permeable soil cap that was constructed by EPA in 2005. Alternative FDDA-3 is implementable but more difficult as it requires constructing an impermeable cap over the former drum disposal area. Additional engineering design effort would be required to determine whether or not the existing permeable soil cap, either partially or wholly, would need to be excavated before constructing the impermeable cap. Construction of an impermeable cap may impact the ability and implementability of the selected groundwater remedy. Alternatives FDDA-2 and FDDA-3 also includes institutional controls which are implementable.

With regard to groundwater management of migration alternatives, alternative GW-2 is easily implementable as it allows natural attenuation processes to address groundwater contamination. Alternatives GW-3 and GW-4 are also implementable but more complex as they require the completion of treatability studies, engineering design efforts, and construction before the various treatment systems can be operated. Alternatives GW-2, GW-3 and GW-4 also involve the implementation of institutional controls and long-term monitoring programs which are implementable.

Cost

Costs are summarized in the tables below as estimated total net present worth costs. Costs for the selected remedy are highlighted in bold text.

Summary of Source Control Costs

	L-1	**L-2**	L-3	FDDA-1	**FDDA-2**	FDDA-3
Total Net Present Worth Cost	$12,400	**$587,503**	$2,218,421	$12,400	**$70,320**	$1,116,593

With regard to source control, the selected remedy offers the best balance of achieving a high level of protectiveness in the most cost effective manner.

Summary of Management of Migration Costs

	GW-1	**GW-2**	GW-3	GW-4
Total Net Present Worth Cost	$12,400	**$2,347,271**	$2,941,953	$6,640,920

With regard to the management of migration, the selected remedy is the most cost effective, excluding GW-1 (no action).

5. The Selected Remedy Does Not Satisfy the Preference for Treatment as a Principal Element

The selected remedy at the Troy Mills Landfill Site involves allowing naturally occurring processes to continue reducing contaminant concentrations in groundwater; capturing and removing free product (i.e., LNAPL) from groundwater in a series of interceptor trenches constructed by EPA in 2003; maintaining a permeable soil cap that was constructed by EPA in July-August 2005 over the former drum disposal area; and implementing and maintaining institutional controls.

Based on the recent completion of a drum removal action by EPA's Removal Program, which eliminated the primary source of Site contamination; the remote location of the Site; the lack of current human health risks; and the relatively low levels of contamination present, EPA concluded that it was impracticable to remove and treat the chemicals of concern in a cost-effective manner. Thus, the selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy.

6. Five-Year Reviews of the Selected Remedy are Required.

Because this remedy will result in hazardous substances remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within five years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

N. DOCUMENTATION OF NO SIGNIFICANT CHANGES

EPA presented a Proposed Plan, which included source control and management of migration remediation of the Site, on July 20, 2005. The source control portion of the preferred alternative included capturing and removing free product from groundwater in the existing series of interceptor trenches; maintaining the permeable soil cap over the drum excavation area; and implementing institutional controls. The management of migration portion of the preferred alternative included allowing naturally occurring processes to continue reducing contaminant concentrations in groundwater and implement institutional controls. EPA reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

O. STATE ROLE

The New Hampshire Department of Environmental Services has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessments, and Feasibility Study to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental and facility siting laws and regulations. The State of New Hampshire, through the New Hampshire Department of Environmental Services, concurs with the selected remedy for the Troy Mills Landfill Site. A copy of the declaration of concurrence letter is attached as Appendix A.

PART 3

THE RESPONSIVENESS SUMMARY

PART 3

RESPONSIVENESS SUMMARY
TROY MILLS LANDFILL SUPERFUND SITE
PROPOSED PLAN (July 2005)

September 2005

Introduction

The United States Environmental Protection Agency Region I ("EPA") issued a Proposed Plan for final cleanup of the Troy Mills Landfill Superfund Site ("Site") in July 2005. An informational meeting was held on July 20, 2005, followed by a public hearing on August 18, 2005. A thirty (30) day public comment period was held from July 21 to August 19, 2005. Written and verbal comments were received from community members and other interested parties.

Purpose

All comments received on the Proposed Plan were considered as EPA prepared the Record of Decision ("ROD") which specifies the final cleanup plan to be implemented at the Site. The purpose of this Responsiveness Summary is to document EPA responses to all comments raised and to explain how or why concerns and suggestions were or were not incorporated into the ROD. This Responsiveness Summary provides a complete listing of all comments received. Comments received have been grouped, where possible, into common issues and concerns to allow EPA to respond more effectively.

A copy of the transcript from the public hearing is attached. A complete copy of the individual comments received is available in the administrative record for the ROD.

Overview

The Troy Mills Landfill Site is a two-acre former drum disposal area located approximately 1.5 miles south of the center of Troy, New Hampshire. The two-acre Site is located in the southeastern corner of a larger 270-acre parcel. The Site is surrounded primarily by undeveloped woodlands, a gravel access road to the west, and a former railroad bed currently used as a recreational trail to the east. Rockwood Brook flows south to north alongside the western portion of the Site and continues downstream to Sand Dam Pond, where the Town of Troy's recreational swimming area is located. The nearest residences are approximately ½ mile from the Site.

The Site was used by Troy Mills, Inc. to dispose of drums of hazardous substances that were generated at its manufacturing facility in the center of town. The manufacturing facility and the 270-acre parcel were owned by Troy Mills, Inc. Immediately to the north of the Site is a separate eight-acre solid waste landfill, regulated by the State of New Hampshire, which was used for the disposal of waste fabric scraps and other

miscellaneous solid waste from the former mill. The manufacturing facility and the solid waste landfill are not considered part of the Site.

In September 2003, the Site was listed on the National Priorities List and a time-critical removal action was initiated. The first phase of the removal action included the installation of three light non-aqueous phase liquid (LNAPL) interceptor trenches to capture free product floating on the groundwater. The second phase of the removal action, which as initiated in July 2004, involved the excavation of 7,692 buried drums, the removal of 29,924 gallons of flammable liquid waste and 3,099 cubic yards of sludge, and the excavation of 26,244 tons of heavily contaminated soil which were all transported off-site for disposal at permitted facilities. In the summer of 2005, EPA completed its removal action with the construction of a two-foot thick permeable soil cap over the excavation area to prevent direct contact risks to underlying residual contaminated soils.

In July 2005, EPA released a Proposed Plan for comprehensive cleanup of the Site.

Summary of the Proposed Cleanup Plan

EPA's proposed cleanup plan was a comprehensive remedy developed through consideration of multiple source control and management of migration alternatives as presented in the Feasibility Study ("FS"). LNAPL source control alternatives ranged from no action to maintaining the existing LNAPL interceptor trenches to active extraction and treatment of LNAPL. Former drum disposal area soil source control alternatives ranged from no action to maintaining the permeable soil cap to construction of an impermeable soil cap. Groundwater management of migration alternatives ranged from no action to monitored natural attenuation to utilizing in-situ treatment technologies to constructing and operating a groundwater extraction, treatment, and discharge system.

The proposed remedy was a combination of the source control and management of migration alternatives as follows:

- Allowing naturally occurring processes to reduce contaminant concentrations in groundwater;

- Capturing all potential free product, LNAPL, in a series of existing LNAPL interceptor trenches constructed by EPA in 2003;

- Maintaining a two-foot thick permeable soil cap constructed by EPA in 2005 to prevent potential contact with residual contaminated soil in the former drum disposal area. The permeable cap allows precipitation to infiltrate through the cap and facilitate the cleanup of groundwater;

- Establishing institutional controls that restrict the use of contaminated groundwater for drinking water purposes; restrict excavation activities in the area of the cap, prevent the disturbance of remedy components, and require notification of any changes in the use of the land; and

- Implementing a comprehensive monitoring and sampling program to evaluate groundwater, surface water, sediment, leachate, and wetlands to ensure that natural attenuation processes are continuing as expected;

General Reaction to the Proposed Remedy

Comments received in response to the Proposed Plan by a majority of community members and local government officials expressed support for the proposed remedy.

Concerns raised were generally related to the extent of the proposed area of groundwater use restriction and EPA's involvement in the adjacent solid waste area.

Written Comment List (by name and affiliation) included:

Sharron Wojciechowski (citizen)
Carl Goldknopf (citizen)
F.L. Merlone (citizen)
Jane Mayer (citizen)
Natalie Reid (citizen)
Ralph L. Wentworth (citizen)
Frank Bequaert (citizen)
Evan John (Troy Master Plan Steering Committee)
Kenneth Munney (U.S. Fish and Wildlife Service)

Verbal Comment List – August 18, 2005 hearing (by name and affiliation) included:

Glenn Shattler (Troy Board of Selectmen)
Evan John (Troy Master Plan Steering Committee)

EPA responses to comments are grouped as follows: 1) general non-technical issues raised by multiple commentors, addressed by subject area (i.e., liability, infrastructure, and future land use); and 2) technical issues raised by commentors, which are responded to individually.

All EPA responses are written in **bold** text.

General Issues

1. *Cost (Jane Mayer, Carl Goldknopf, Natalie Reid, Frank Bequaert)*

Four commentors, as identified above, raised questions about the cost of EPA's proposed remedy. One asked who is going to pay the $2.9 million that the recommended plan will cost and added that if federal funds will pay for the cleanup, the plan appears reasonable. Another echoed the concern that the residents of Troy and Fitzwilliam might be expected to pay for the cleanup. A third commentor noted that from the Proposed Plan's

Comparison of Alternatives Table, EPA's proposed remedy is the least expensive, next to the No Action alternatives, and asked if EPA was simply trying to minimize costs. A final commentor noted that the EPA has pledged $8 million to the cleanup of the Troy Mills Superfund Site; however, the proposed remedy costs less than half of this amount.

The cost of EPA's proposed cleanup will be covered by utilizing federal funds along with a 10% State cost share component. Federal and State funds are derived from general tax revenues, and therefore, the cost of the cleanup for the Troy Mills Landfill Site will be borne incrementally by the citizens of Troy and Fitzwilliam, along with all other federal and state taxpayers. The $8 million drum removal action completed by EPA in the summer of 2005 was a significant accomplishment. As a result of this very successful removal action, the remaining activities required for the Site are much more limited and only require maintaining existing cleanup components, monitoring the Site, and implementing institutional controls. The total present worth cost for all remaining activities necessary for the Site total an estimated $3.0 million, which was determined to be the most cost-effective solution needed at the Site to protect public health and the environment.

2. *Current Land Use (Carl Goldknopf)*

One commentor, identified above, noted that EPA's statement under "*Why is Cleanup Needed?*" on page 2 of the Proposed Cleanup Plan, incorrectly describes the former railroad bed as an all-terrain vehicle trail. The commentor emphasized that the statement is misleading and objectionable, as the trail is not an all-terrain vehicle trail unless there is snow cover on it, and asks that the Agency rephrase the statement.

The commentor is correct. The recreational trail described in the Proposed Plan is part of the Cheshire Branch Rail Trail managed by the New Hampshire Department of Resources and Economic Development (NH DRED). Allowable trail uses are limited to horseback riding, mountain biking, hiking, cross-county skiing and other forms of recreation. Snowmobiles and all-terrain vehicles are only allowed on the trail when there is sufficient snow cover to cover the trail. The correct description of the allowable trail uses has been incorporated in the ROD.

3. *Future Land Use (Sharron Wojciechowski, Glenn Shattler)*

Two commentors, as identified above, commented on the future use of the Site. One asked whether the neighboring residents of Fitzwilliam and Troy would be notified and given the opportunity to respond to any requests to change the current use of the Site. Another commentor stressed that while the Town of Troy would like to have the Site open for public use, motorized and 4-wheel drive vehicles could damage the soil cap, and asked if EPA could secure the Site from motorized vehicles by blocking off access points.

In general, land use planning is a local matter which is dictated by zoning regulations and other local factors. The Site is currently privately owned. The

objective of the notification requirement outlined in the ROD, which calls for EPA to be notified of any proposed change in land use for the 270-acre property, is to ensure that any proposed land use changes do not impact EPA's remedy components and possibly change EPA's current and future risk assumptions for the Site. Potential land use changes are under the control of the landowner and are regulated under local and state land use standards.

With regard to restricting vehicular access, entrance to the Site will continue to be restricted, in coordination with the landowner, through the maintenance of two existing locked chain-link gates along the dirt access roads that lead to the Site. One of these gates is located at the southern entrance to the Site, along the gravel access road that leads to the Site from Rockwood Pond Road. The second gate is located at the northern entrance to the site, along the gravel access road that leads to the Site from Water Street and the center of town.

4. *Current Ownership of the Property (Evan John)*

One commentor, identified above, asked if more information on the current status on the ownership of the property could be provided and if EPA could provide guidance to the town on how to communicate with the Agency as the Town of Troy considers how the property should be used.

The property is currently owned by Troy Mills, Inc., which is under Chapter 7 bankruptcy. A bankruptcy trustee has been appointed to oversee the property until the bankruptcy is finalized. EPA will continue to coordinate with Troy Mills, Inc., the bankruptcy trustee, the State, and the Town concerning remedial matters on the property.

5. *Future Ownership of the Property (Evan John)*

One commentor, identified above, stated that town (Town of Troy) ownership of the property is in EPA's and the region's best interest, however paying hundreds of thousands of dollars to cap the solid waste landfill would be an onerous burden to the community. The commentor added that the property is landlocked and will have a $9 million lien upon it, making it very difficult for the Town of Troy to sell off any portion of the property to raise money for capping the solid waste landfill.

EPA has met with the Town to discuss its potential future interest in the property. The property's status under the Chapter 7 bankruptcy is expected to be resolved soon. While EPA has no role in determining ownership of the property, the Superfund statute does allow the government to put a lien on the property to protect its financial interest in cleaning up the Site. Therefore, EPA will continue to work with any landowner of the property, including the Town, if it chooses to acquire the property, to address outstanding remedial issues at the Site.

However, the State has jurisdiction over determining the standards and costs for closing the solid waste landfill on the property, which is not part of the Site.

6. *Acceptable Risk* *(Natalie Reid)*

One commentor, identified above, emphasized that it is unsatisfactory to have any contaminants in the environment; therefore there is no such thing as "acceptable risk." In addition, the commenter asked how the chemicals might affect the reproduction cycle of creatures that cannot tolerate what the Agency identifies as an acceptable risk level for humans.

EPA's goal is to reduce the level of contamination to a safe level, that is, the level at which drinking the water, breathing the air or contacting the soil is not a health concern, both to human health and the environment. We acknowledge that this does not mean totally free from risk. Because there are uncertainties in estimating health risks associated with exposure to chemicals, EPA bases estimates of health risks and cleanup goals on conservative assumptions of toxicity and exposure that overestimate risk. The ecological risk assessment that was conducted does take into account the risk to the reproductive cycle of target species and determined that remaining contaminant levels did not pose a risk. Thus, EPA expects actual risks at the Site to human health and the environment to be much lower than estimated.

7. *Cleanup Timeframes* *(Natalie Reid)*

One commentor, identified above, noted that the Proposed Plan includes intangible timeframes such as the following: "...the groundwater contaminant levels will continue to decrease over time through natural attenuation," and asked how much time it will take for the natural attenuation processes to decrease contaminant levels.

Based on information presented in the Remedial Investigation (RI) Report, active biodegradation of chlorinated VOCs and aromatic VOCs is occurring at the Site. In addition, elevated manganese levels were found to be associated with the degrading dissolved organics in groundwater and are expected to reduce over time along with the attenuation of the organics. The modeling performed as part of the RI shows that some contaminants will be reduced to drinking water levels in less than 30 years, while others could take longer than that. Only further groundwater monitoring will provide the data necessary to determine a better estimate of remediation time.

In the interim, EPA will implement institutional controls at the Site which will include delineating a State of New Hampshire Groundwater Management Zone (GMZ), within which use of groundwater for drinking water purposes is prohibited. A comprehensive monitoring program will also be implemented to periodically test the groundwater within and outside the GMZ to confirm that natural attenuation processes are occurring as expected. If natural attenuation does not occur as

anticipated, EPA will take additional remedial measures, as appropriate, to address groundwater contamination.

8. *Public Notice* *(Frank Bequaert)*

One commentor, identified above, noted that the invitation to attend the open house was not received until a week after the event. Further, the commentor noted that setting the deadline for submitting comments on the Proposed Plan one day after the public hearing was an insufficient amount of time if any research was required prior to commenting.

EPA sent informational mailings to its list of local residents and other interested parties announcing the public meeting and the start of the public comment period several days before the event. The announcement also let the public know about the start of the 30 day public comment period. Legal notices of the public meeting and the start of the public comment period were also published in the Keene Sentinel on July 15 and 22, 2005. The public information meeting was held at the beginning of the public comment period. Whereas the public hearing, the purpose of which was to give the public an opportunity to present comments to the Agency in person, was scheduled before the close of the comment period. EPA regrets that the commentator did not receive notice earlier.

Technical Issues

9. *Long-term Site Monitoring* *(F. Merlone, Ralph Wentworth)*

Two commentors, as identified above, remarked on long-term monitoring of the site. One commentor suggested that a five year time period would not be acceptable or rational for leachate and groundwater monitoring. Another commentor noted that the community will welcome periodic reports of the effectiveness of natural attenuation on addressing contamination at the Site.

EPA plans to monitor contaminant levels in groundwater, surface water, sediment, leachate, and wetland soil in and around the Site indefinitely until the respective cleanup levels are achieved. In addition, as required by law, EPA will conduct a comprehensive review of the remedy at least once every five years to assure that the remedial action continues to protect human health and the environment. These five-year reviews will also be performed indefinitely as long as hazardous substances remain at the Site above risk levels or in exceedances of statutory limits.

EPA is committed to proactive community participation in Superfund actions and will remain available to provide periodic updates to the community on the progress of the cleanup at the Troy Mills Landfill Site. These updates may be in the form of periodic news releases, newsletters, and/or public presentations to the community. Periodic reports will also be made available at the Site repository at the Gay-Kimball Public Library.

10. *Groundwater Management Zone* *(Carl Goldknopf, Glenn Shattler)*

Two commentors, as identified above, raised concerns regarding the Groundwater Management Zone. One noted that should the plume continue to move downstream, the GMZ boundary will have to move with it, making it necessary to further restrict groundwater supply wells. Another asked if the GMZ could be expanded to include both the former drum disposal area and the adjoining state regulated solid waste landfill.

The GMZ, as it is currently delineated, is intended to capture the full extent of contaminated groundwater emanating from the Troy Mills Landfill Site. Contaminated groundwater from the Site is not expected to migrate beyond the identified GMZ extent. However, if contaminated groundwater does migrate beyond the identified GMZ extent, EPA will modify the boundary of the GMZ. EPA is not authorized to restrict groundwater use in other areas not impacted by the Troy Mills Landfill Site. As such, EPA can not expand the GMZ to include the adjoining state-regulated solid waste landfill.

11. *Solid Waste Landfill Cap* *(Glenn Shattler, Evan John)*

Two commentors, identified above, raised concerns about the adjacent state-regulated solid waste landfill. One commentor requested that the 8-acre solid waste landfill be capped in addition to the 2-acre former drum disposal area, so that both the solid waste landfill and the former drum disposal area are addressed. Another commentor asked that EPA explain what final closure requirements for the state regulated solid waste landfill would satisfy both the New Hampshire Department of Environmental Services (NHDES) and EPA and asked that the Agency work with NHDES to come up with an option for capping the solid waste landfill.

EPA's Superfund authority is restricted to mitigating risks to human health and the environment from hazardous substances. State environmental agencies are responsible for regulating solid waste landfills, such as the adjacent 8-acre solid waste landfill area. Currently, there is no evidence of hazardous substances emanating from the solid waste landfill at levels that could pose a federally-defined risk to human health and the environment. As such, EPA's Superfund program does not have the authority to address the solid waste landfill. However, EPA did restore approximately 5-6 acres of the solid waste landfill that were utilized for staging areas for the Superfund removal action. This restoration consisted of removing any exposed textile debris, covering the 5-6 acre area with 6-24 inches of sand and loam, and planting the covered area with a grass seed mix to prevent erosion.

EPA is aware that the NHDES has communicated with the Town clarifying the closure requirements for the solid waste landfill. NHDES should be contacted to further discuss the State's closure requirements for the adjacent solid waste landfill area.

12. *Former Drum Disposal Area Cap (Kenneth Munney)*

One commentor, identified above, noted that it is unclear, as stated in the Proposed Plan, how a permeable cap over the former drum disposal area will meet site closure requirements and what actions will be taken to remedy this issue.

The permeable cap will meet the relevant and appropriate standards under the State Solid Waste Regulations for closure and post-closure of landfills, specifically provisions requiring monitoring and maintenance of the cap. Regulatory provisions for installing an impermeable cap were deemed not to be appropriate for the remedy, since a permeable cap would better enhance the groundwater remediation component of the remedy. The permeable cap was determined to be equally protective as an impermeable cap in preventing the primary risk from contact with the low-level contaminated soils under the cap.

13. *On-going Operation of the LNAPL Interceptor Trenches (Carl Goldknopf)*

One commentor, identified above, raised the concern that while EPA might decide at some future time that LNAPL levels have declined and contaminant concentrations in leachate no longer pose an unacceptable risk requiring continued operation and maintenance of the interceptor trenches; the community may not agree with EPA's definition of an acceptable risk level and instead want the Agency to continue operating the interceptor trenches. In particular, the commentor asked who decides what acceptable or unacceptable risk levels are.

As described in the ROD, the interceptor trenches only address LNAPL (free product) floating on the surface of the groundwater. The system will be operated until no more LNAPL is present. Since EPA's removal program has eliminated most of the source of LNAPL (i.e., 7,692 buried drums), it is expected that the LNAPL levels will diminish significantly over a short period of time (possibly less than 1-2 years). Contaminant levels in the leachate are also expected to significantly decline as a result of the on-going LNAPL removal.

As stated previously, EPA's goal is to reduce the level of contamination to a safe level, that is, the level at which drinking the water, breathing the air or contacting the soil is not a health concern. Because there are uncertainties in estimating health risks associated with exposure to chemicals, EPA bases estimates of health risks and cleanup goals on conservative assumptions of toxicity (from studies of human or animal exposures) and exposure that overestimates risk. Thus, EPA expects actual health risks at the Site to be lower than currently estimated.

With respect to the definition of acceptable risk, EPA will use the range of approximately 1 in a million to 1 in ten thousand (1 in 1,000,000 to 1 in 10,000) probability of getting cancer in determining if its cleanup actions protect human health. EPA's estimates are upper bound estimates which mean that the true risks may be much lower. Finally, with respect to chemicals that may cause noncancer

effects (for example, liver or kidney damage), EPA sets cleanup goals at levels below which no human health concerns are expected.

14. *Reduction of Toxicity, Mobility and Volume of Contamination* *(Natalie Reid)*

One commentor, identified above, emphasized that alternatives GW-2 and LC-2 fail to reduce the toxicity, mobility, and volume of the large number of chemicals that have saturated the groundwater and leachate at the site and suggested that the better choices are alternatives GW-3 and LC-3 which do more to reduce the problem of toxicity.

Based on the recent drum removal action by EPA's Removal Program, which eliminated the primary source of contamination at the Site; the remote location of the Site; the lack of current human health risks; and the relatively low levels of contamination present, EPA concluded that it was not cost effective to remove and treat the remaining contaminants at the Site other than as provided in EPA's proposed remedy.

Since EPA will continue to monitor Site conditions and review the remedy's progress at least every five years, an evaluation of the reduction of toxicity, mobility, and volume offered by EPA proposed remedy will be performed.

15. *Impacts to the Wetlands Downgradient of the Former Drum Disposal Area* *(Kenneth Munney)*

One commentor, identified above, considers the Preliminary Remediation Goal (PRG) for manganese to be problematic relative to potential impacts to ecological receptors and added that the current proposed PRG is well in excess of potential ecological effect concentrations for sediments and soils and may pose risk to invertebrates, amphibians and other riparian biota, along with other contaminants of concern.

As part of the RI, EPA conducted a baseline ecological risk assessment (BERA) of Rockwood Brook surface water, sediment, and wetland soil. Risks from exposure to chemicals of potential concern (COPCs) in wetland soil were estimated using a terrestrial food chain model for short-tailed shrew (*Blarina brevicauda*). Because of the unavailability of Site-specific, wetland soil invertebrate (earthworm) tissue chemical data, concentrations of the COPCs in this prey item of the shrew were estimated using a wetland soil uptake model and incidental soil ingestion to derive Reasonable Maximum Exposure (RME; 95% UCL) or Central Tendency Exposure (CTE; arithmetic mean) concentrations. COPC doses to shrew at RME or CTE concentrations were then compared to literature toxicity reference values (TRVs) that pertained to shrew, and hazard quotients (HQs) were calculated for each COPC in wetland soil. RME or CTE risks to shrew were assessed based the magnitude of the HQs and an uncertainty analysis.

Shrew HQs for wetland soil were below unity (HQs<1) with the exception of manganese which had an RME HQ=2.5; however, the CTE HQ was less than unity.

The remainder of COPCs in wetland soil showed a negligible risk to the shrew at either RME or CTE concentrations. Given the uncertainties and assumptions inherent in the use of wetland soil uptake factors and exposure models for manganese, and given that all other wetland soil COPCs besides manganese showed negligible RME risks, the risk to shrew from wetland soil COPCs was determined to be negligible.

The risk to aquatic receptors from exposure to COPCs in Rockwood Brook sediment were assessed using Site-specific, 10-day whole sediment toxicity tests of survival and growth under controlled conditions in the lab with midge insect larvae (*Chironomus tentans*) and freshwater amphipods (*Hyalella azteca*). The results of these tests indicated that Rockwood Brook sediment was not toxic, and therefore did not pose an unacceptable risk to other aquatic receptors of the type. The results of AVS-SEM analysis of the sediment provided indication that divalent metals were non-bioavailable. It is also important to note that the tests results were from sediment collected downgradient of the area of assessed wetland soil (see discussion above). Therefore, the sediment toxicity tests were a general estimate of the potential risk that wetland soil might pose to aquatic receptors should soil-bound COPCs happen to migrate into the Brook.

The wetland soil PRG for manganese was developed based on human health risk scenarios. Again, at the current concentrations of manganese found in the wetland, risk to shrew was determined to be negligible.

16. *Wetlands Mitigation* *(Kenneth Munney)*

One commentor, identified above, recommends that mitigation for wetland loss be performed on-site as part of ARAR Executive Order 11990. In addition, the commentor recommends that when future monitoring determines groundwater leachate has reached acceptable ecological contaminant thresholds, that contaminated wetland soils/sediments be removed and the area restored to its original functions and values. Finally, the commentor supports the proposed mitigation for impacts from institutional controls and their installation in the wetland area.

EPA plans to implement a comprehensive monitoring program that will include the sampling of Rockwood Brook surface water, sediment, and wetland soil. Currently, as no significant ecological risk has been identified to potential receptors within Rockwood Brook and its wetlands, no actions are proposed to address ecological risk. However, if EPA's monitoring program indicates that Rockwood Brook and its wetland are becoming impacted, EPA will consult with the appropriate resource agencies such as the U.S. Fish and Wildlife Service (FWS). In addition, once groundwater and leachate concentrations dissipate below cleanup levels, final wetland monitoring activities will be conducted and will include an evaluation of the wetland (which might include conducting a wetland functions and values assessment; visual observation of stained soil, iron staining, and/or stressed vegetation; etc.), as appropriate. If EPA, in consultation with FWS, determines that

the wetlands have been impacted, EPA will assess what, if any, mitigation efforts, in accordance with Executive Order 11990, may be required to mitigate the impacts to the wetland.

17. *Leachate (Kenneth Munney)*

One commentor, identified above, commented that there are no Site-related toxicity data to support the statement in the Feasibility Study that no significant ecological impacts were noted to be associated with the leachate.

Based on a comparison of surface water COPC to ecological effects concentrations for the COPCs from the scientific literature, there was negligible risk to aquatic receptors in Rockwood Brook surface water. Based on the results of the sediment toxicity testing, there was negligible risk to aquatic receptors that may be exposed to Rockwood Brook sediments. As noted previously, ecological risk to shrew from wetland soil COPCs transferred through the food chain (earthworm predation) or directly (incidental soil ingestion) was also determined to be negligible.

As a result, based on chemical data from Site-specific environmental sampling at the Troy Mills Landfill Superfund Site, Site-specific toxicity testing, food chain modeling, comparison to background concentrations, and with an analysis of uncertainties, the BERA concluded that there is a negligible ecological risk to aquatic life in Rockwood Brook and wildlife in the bordering wetland.

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

BOSTON REGION

In the Matter of:

PUBLIC HEARING:

RE: TROY MILLS LANDFILL SUPERFUND SITE

Meadowood Assembly Hall
Bowkerville Road
Fitzwilliam, New Hampshire

Thursday
August 18, 2005

The above entitled matter came on for hearing, pursuant to Notice at 7:35 p.m.

BEFORE: MIKE JASINSKI, Chief, NH/RI Superfund Section
ANGELA BONAIRIGO
JAMES CHOW
U.S. Environmental Protection Agency
Region 1, New England
Office of Site Remediation & Restoration
One Congress Street
Suite 1100
Boston, MA 02114-2023
(617) 918-1111

JOHN SPLENDORE, DES, New Hampshire

I N D E X

PANEL:	PAGE
MIKE JASINSKI, Environmental Protection Agency	3
SPEAKER:	PAGE
GLENN SHATLER, Selectman, Town of Troy	4
EVAN JOHN, Master Plan Steering Committee	6

P R O C E E D I N G S

(7:35 p.m.)

MR. JASINSKI: Good Evening. Mike Jasinski with EPA, Boston office. I'll be your Hearing Officer for this evening. I think Angela and James have already gone through pretty much the preliminaries here, key things as Angela noted.

We will not respond to your comments when you make them this evening. However, we will prepare written responses to each of your comments. As part of that record co decision, that James indicated we do, what we prepare is a responsiveness summary, that's usually attached to the documents, the comments, and our responses to them. And in some cases we have made changes to our proposals based on those comments, sometimes not. But again, we will not respond to your comments.

I'll ask you to come up to this podium if you wish to speak and make your statement for the record. We do have a Court Reporter taking notes, verbatim, every word you say. I've seen some very interesting notes when I say things when I speak in front of a stenographer.

Feel free to take the time you want with your comments. We're not going to limit anything right now. If it gets a little late, we'll try to get out of here by 9:00 but I don't think that's going to be an issue here.

So if I could ask that if you do have a comment, come up to the podium, state your name, your affiliation with the site, be it Selectman or reporter or just an interested citizen. And speak clearly for Jeff so we can get it clearly into the record.

With that, I'll open up the hearing for anybody that wants to come up and speak.

MR. SHATLER: My name is Glenn Shatler, I'm a resident of Troy and Selectman in the Town of Troy.

First off, I'd just like to thank everybody involved in the project, from the people in town who have given EPA information to everybody in EPA, DES our representatives in the federal government who have come up with the money to clean this site up. I think it's a poster child for how things can get done when everybody cooperates. I do have a couple comments that I'd ask like to ask (sic).

The first one is regarding the Ground Water Management Area. I realize EPA has specific areas they deal with on the project, and the other areas may be dealt with by a different agency or even a state agency.

But it seems to me like some of the areas that are in the Ground Water Management Area -- I guess, as a whole, the landfill area is approximately ten acres, only a portion of it is the barrel side. Some of those areas overlap and some of them don't. It seems to me that it would be

appropriate to include the whole landfill in the Ground Water Management Area because I don't think you'd want somebody sinking a well in a solid waste landfill either.

I realize it may not be in EPA's particular action here to deal with that, but I think that's something that should be considered. I think you said five to seven acres are going to be protected, some of it is not actually in the landfill area, it's surrounding it. But the portion that is the landfill should be protected in the Ground Water Management Area.

And with that I think it might be a good idea to -- you've done a wonderful job up there, it looks great, the grass is growing, but it might be a good idea to, while we're there, cap the whole ten acre site, so that if it's all capped nobody has to go in there and ever deal with it again.

The second comment is regarding your trying to protect the area from disturbance in the future. I think it'd be important for EPA to do as much as they can to kind of -- I'd like the site to be open to the public, but I think, probably, the most damage you might get to the site is from either 4-wheel drives or motorized vehicles going in there and driving on the cap.

I think it'd be very helpful to you and the communities involved that if you can do as much -- I mean, I

wouldn't want you to fence the site, but I mean do as much as you can to secure the site from access from motorized vehicles. I know a lot of pedestrians like to walk and bicycle up there, I don't think they're going to do a lot of damage. But the motorized vehicles, sometimes they can get carried away, I think if you make sure any acces points are blocked off. In the winter I don't think it's as much of a problem. But in the summertime, it can be a problem.

And I'd just like to thank everybody again. I think it's been a wonderful process working with Tom and John Splendore, and I don't have to mention everybody's name but I'll leave somebody out, but everybody has been really cooperative and we greatly appreciate the efforts you guys put forward. This is a big load off the Town of Troy's mind. We know this is cleaned up now and it's going in the right direction, and we really appreciate everybody's cooperation. Thank you.

MR. JASINSKI: Thank you, Glenn.

Does anybody else want to step up and state your name and make a comment for the record on the proposed plan for Troy Mills?

MR. JOHN: Yes.

MR. JASINSKI: Sure.

MR. JOHN: My name is Evan John, I am the Chairman of the Master Plan Steering Committee for the Town of Troy.

And I guess I'm just seeking a little more information on the current status of the ownership of the property and some guidance from the EPA on how to communicate with the Agency as the Town begins to consider how that property should be used. And I guess that's all.

MR. JASINSKI: Thank you, Evan.

Anyone else wish to make a statement for the record? I'm not going to force anybody.

(No response.)

MR. JASINSKI: Comment period does end tomorrow. You can send emails, modern technology, to James by tomorrow. You can put a letter in the mail for thirty-seven cents marked to James, as long as it's postmarked by then. Comment period does end tomorrow at midnight as Angela said.

I appreciate you coming this evening to listen to us, and make statements if you did and if you didn't, just come to listen.

Thank you, again. Have a good evening.

(Whereupon, at 7:40 p.m., the hearing was concluded.)

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: U.S. ENVIRONMENTAL PROTECTION AGENCY in the Matter of:

PUBLIC HEARING:

TROY MILLS LANDFILL SUPERFUND SITE

Place: Fitzwilliam, New Hampshire

Date: August 18, 2005

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above entitled proceeding.

Jeffrey Mocanu Reporter	08/18/2005 Date
Jennifer Goguen Transcriber	08/30/2005 Date

FIGURES

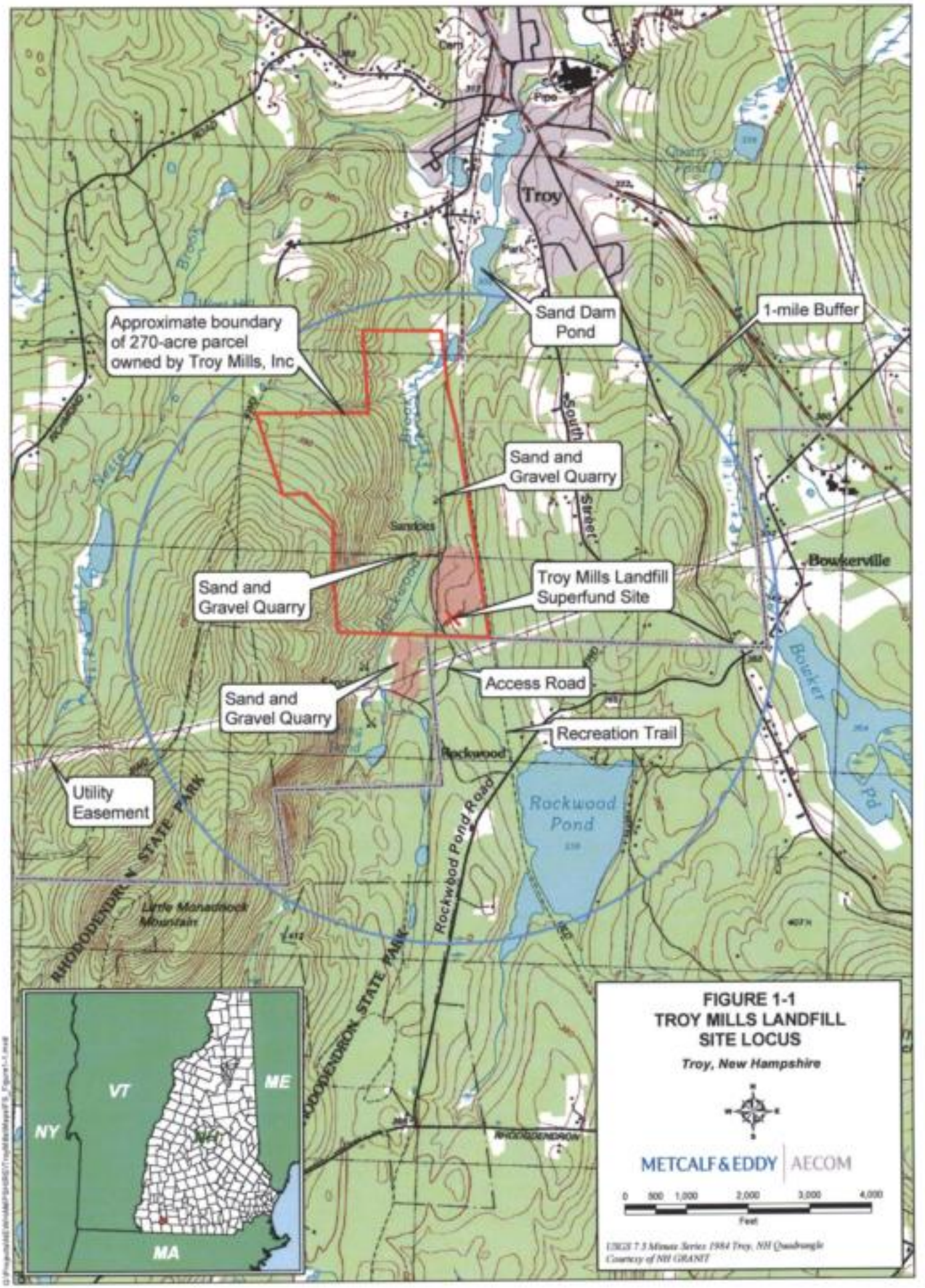
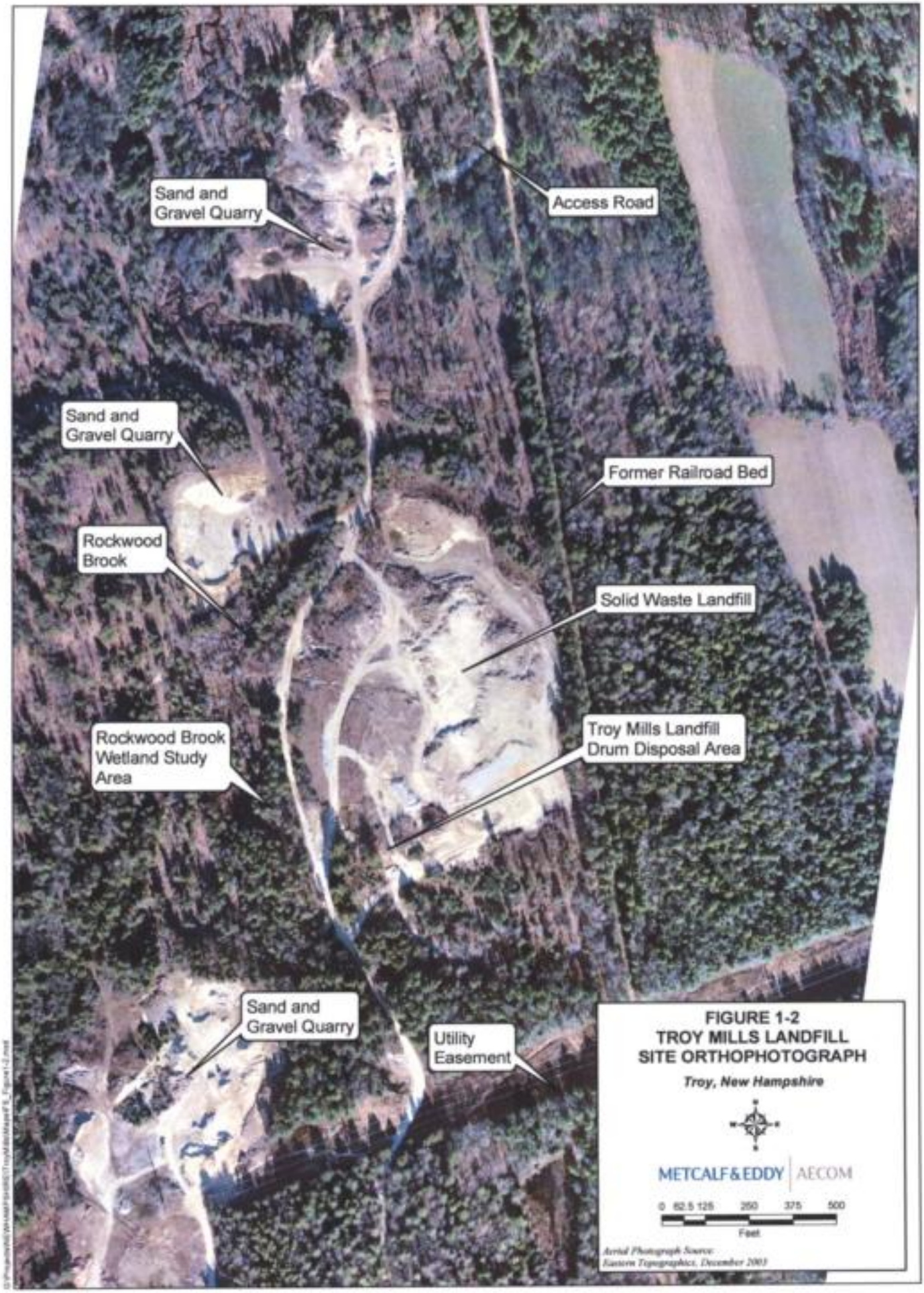
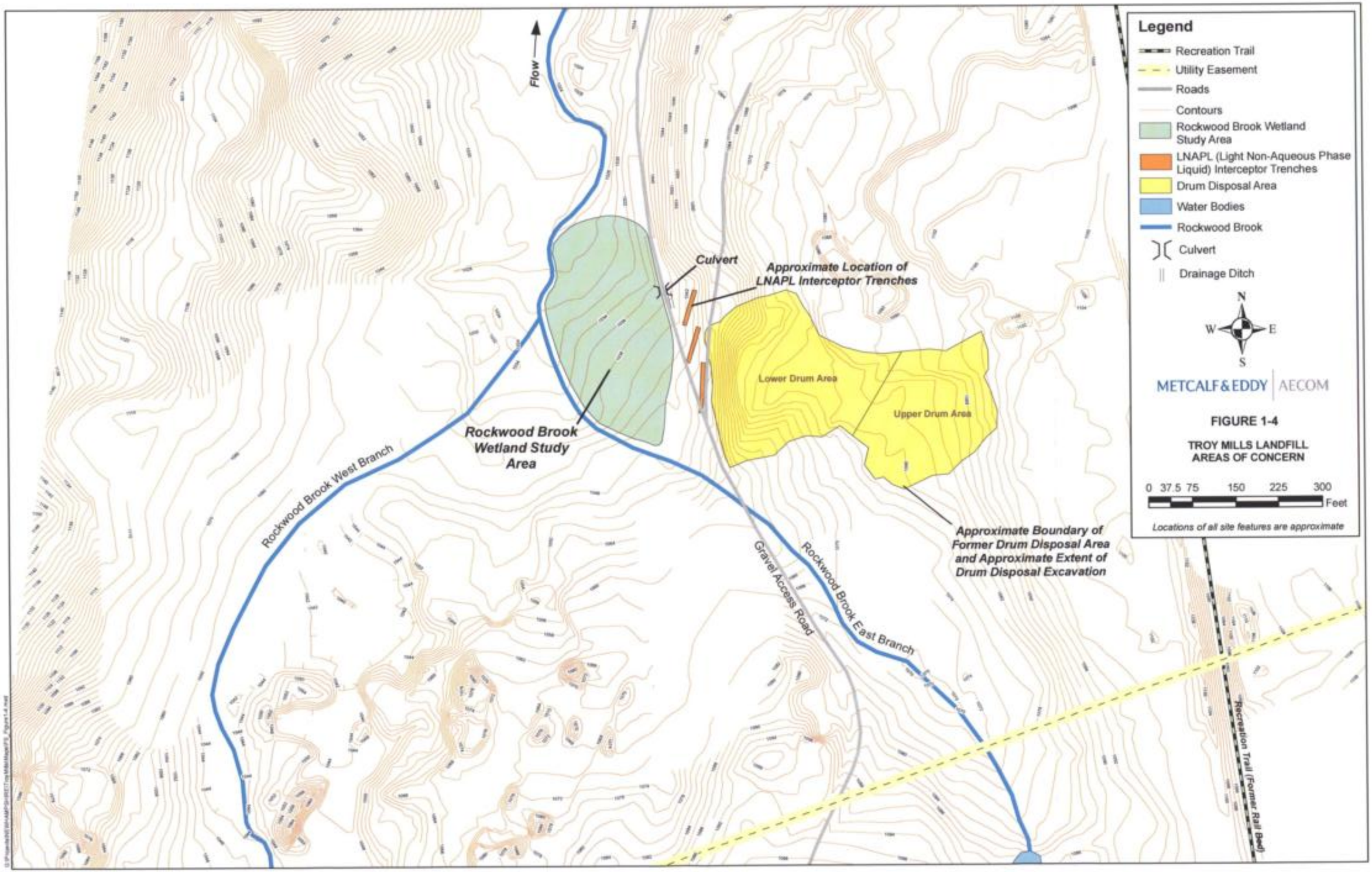


FIGURE 1-1
TROY MILLS LANDFILL
SITE LOCUS

Troy, New Hampshire


Sand and Gravel Quarry
Access Road
Sand and Gravel Quarry
Former Railroad Bed
Rockwood Brook
Solid Waste Landfill
Rockwood Brook Wetland Study Area
Troy Mills Landfill Drum Disposal Area
Sand and Gravel Quarry
Utility Easement
FIGURE 1-2
TROY MILLS LANDFILL
SITE ORTHOPHOTOGRAPH
Troy, New Hampshire
METCALF & EDDY | AECOM
0 62.5 125 250 375 500
Feet
Aerial Photograph Source:
Eastern Topographics, December 2003


Flow
Culvert
Approximate Location of LNAPL Interceptor Trenches
Lower Drum Area
Upper Drum Area
Rockwood Brook Wetland Study Area
Rockwood Brook West Branch
Gravel Access Road
Rockwood Brook East Branch
Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation
Recreation Trail (Former Rail Bed)
Legend
Recreation Trail
Utility Easement
Roads
Contours
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Water Bodies
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 1-4
TROY MILLS LANDFILL
AREAS OF CONCERN
0 37.5 75 150 225 300
Feet
Locations of all site features are approximate

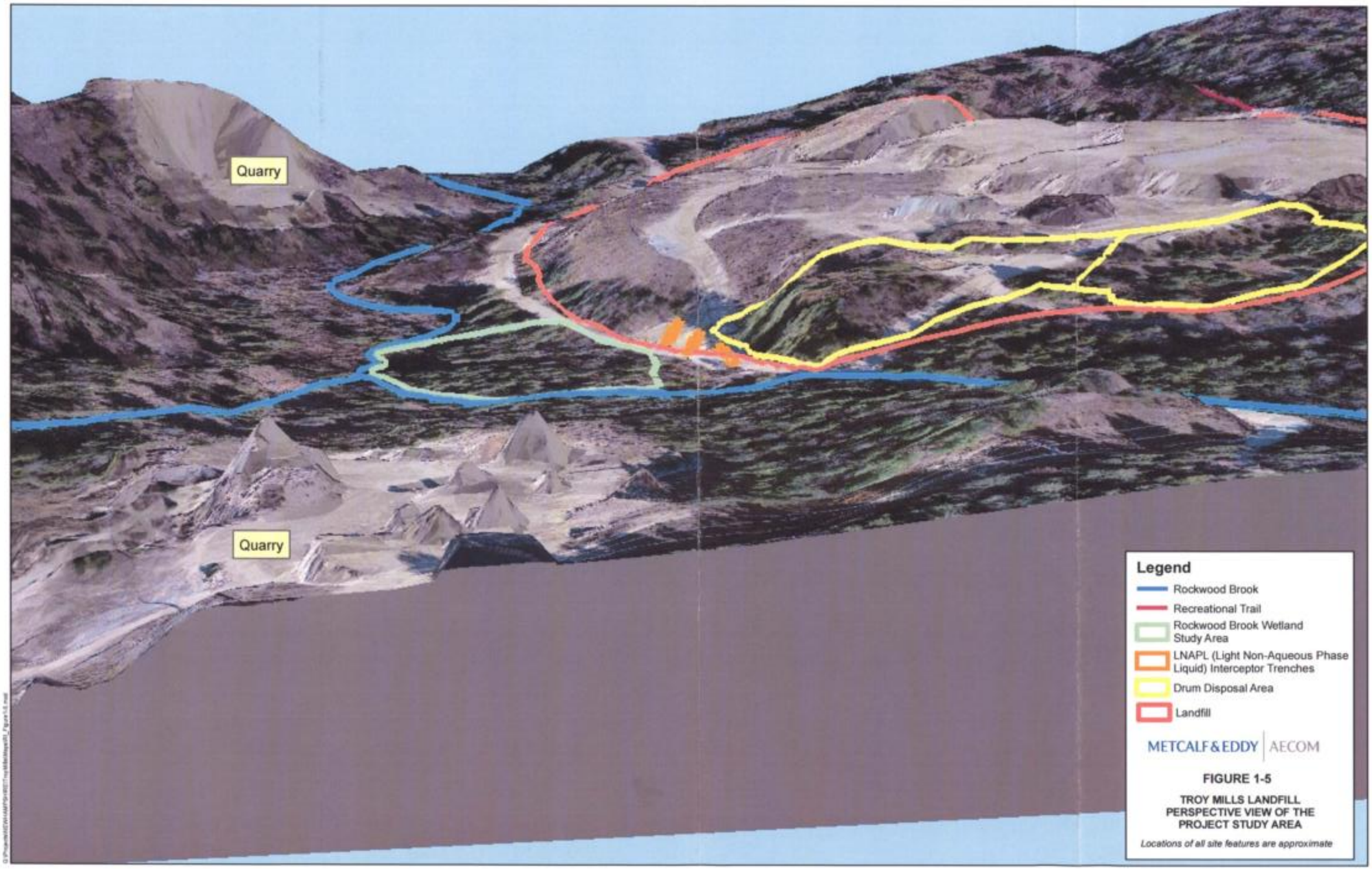
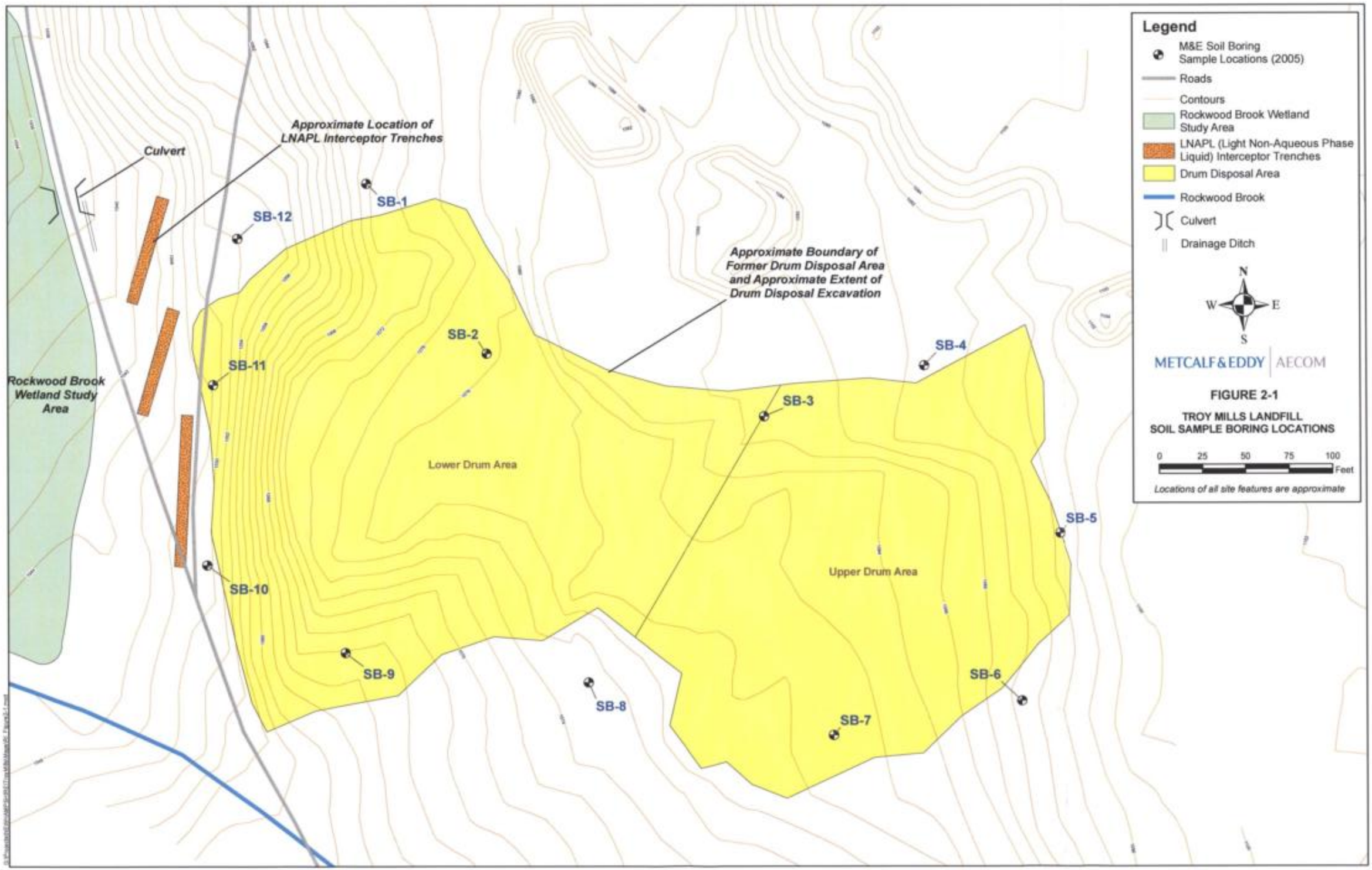
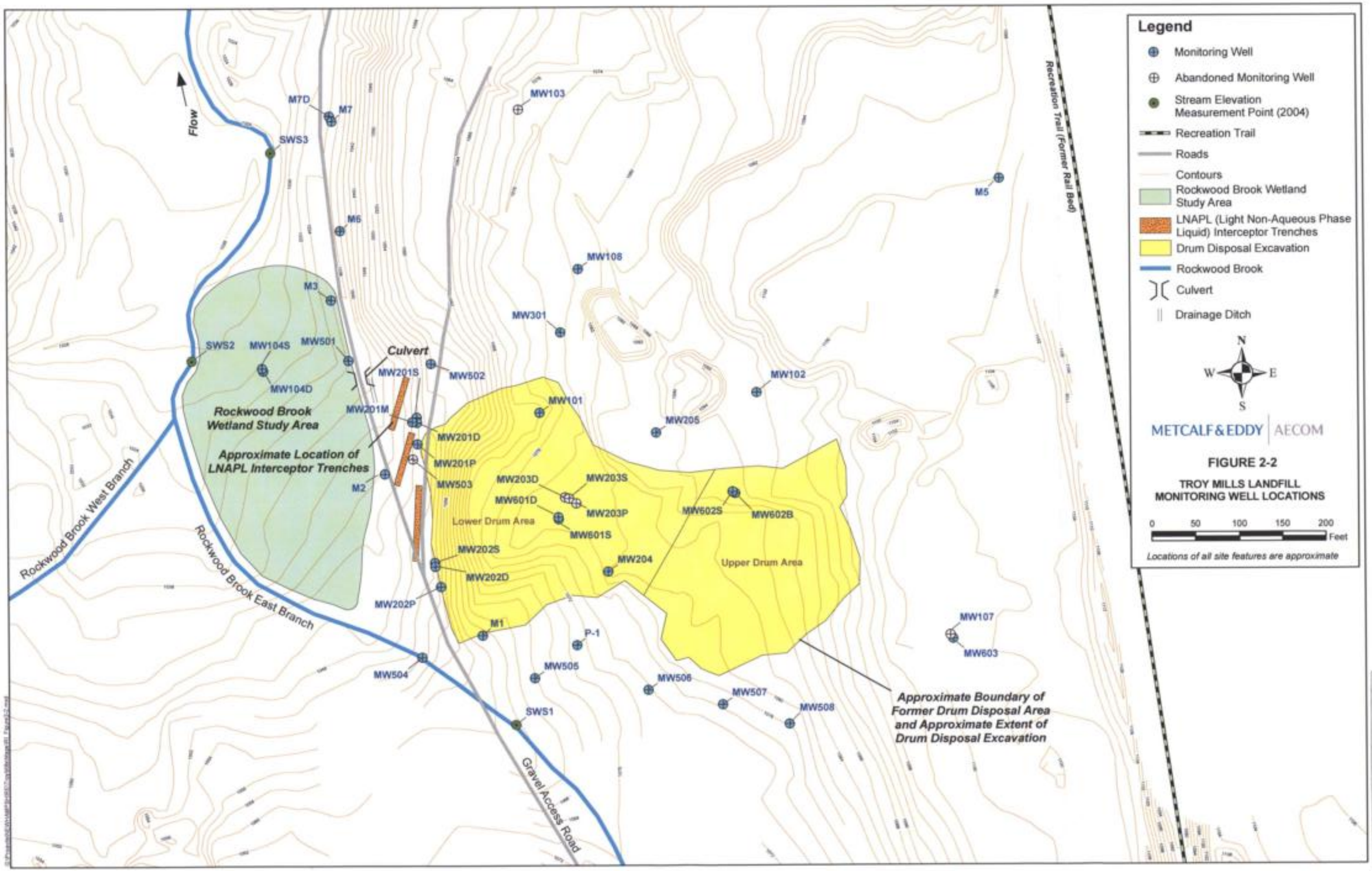


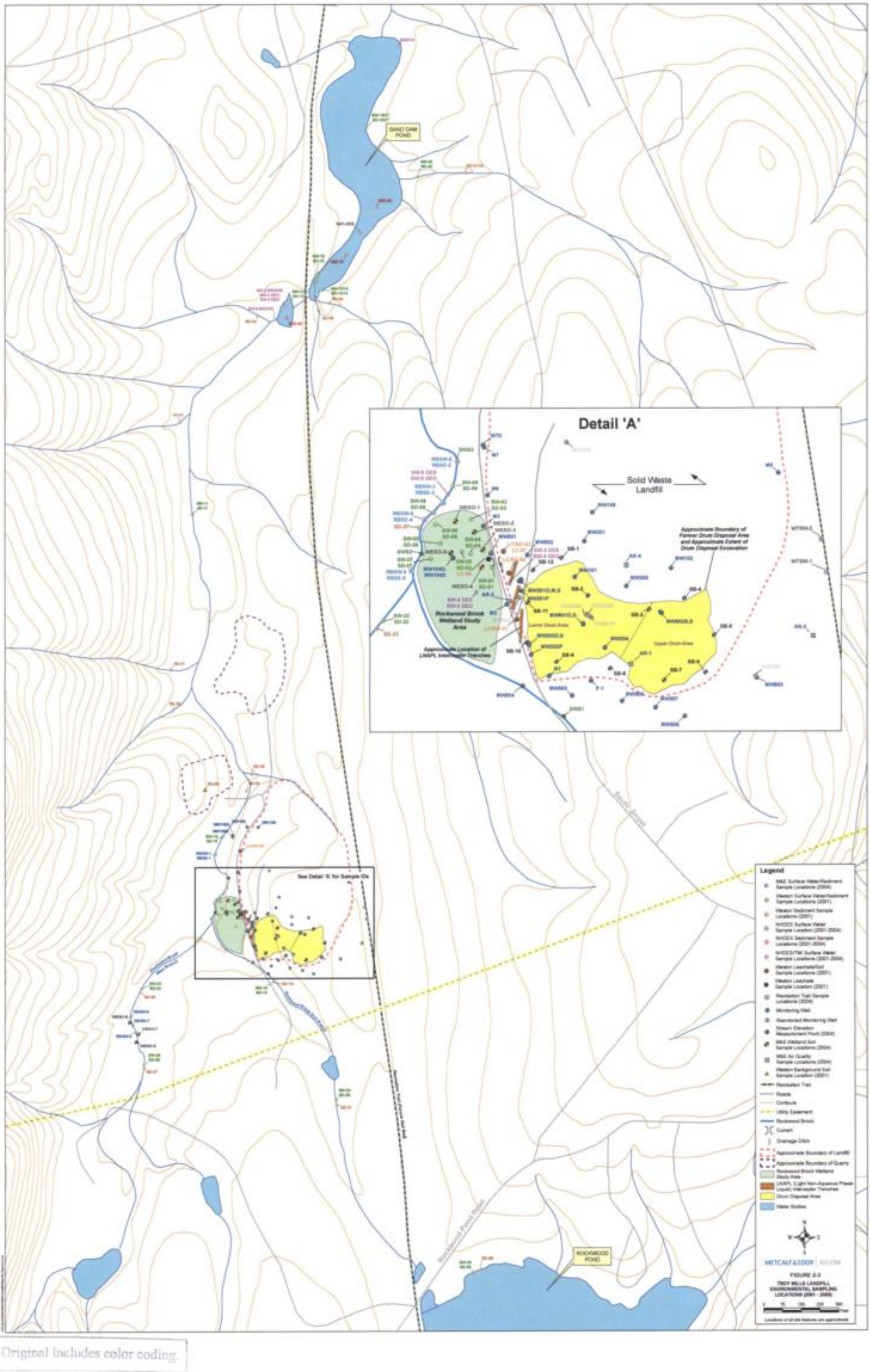
FIGURE 1-5

TROY MILLS LANDFILL
PERSPECTIVE VIEW OF THE PROJECT STUDY AREA

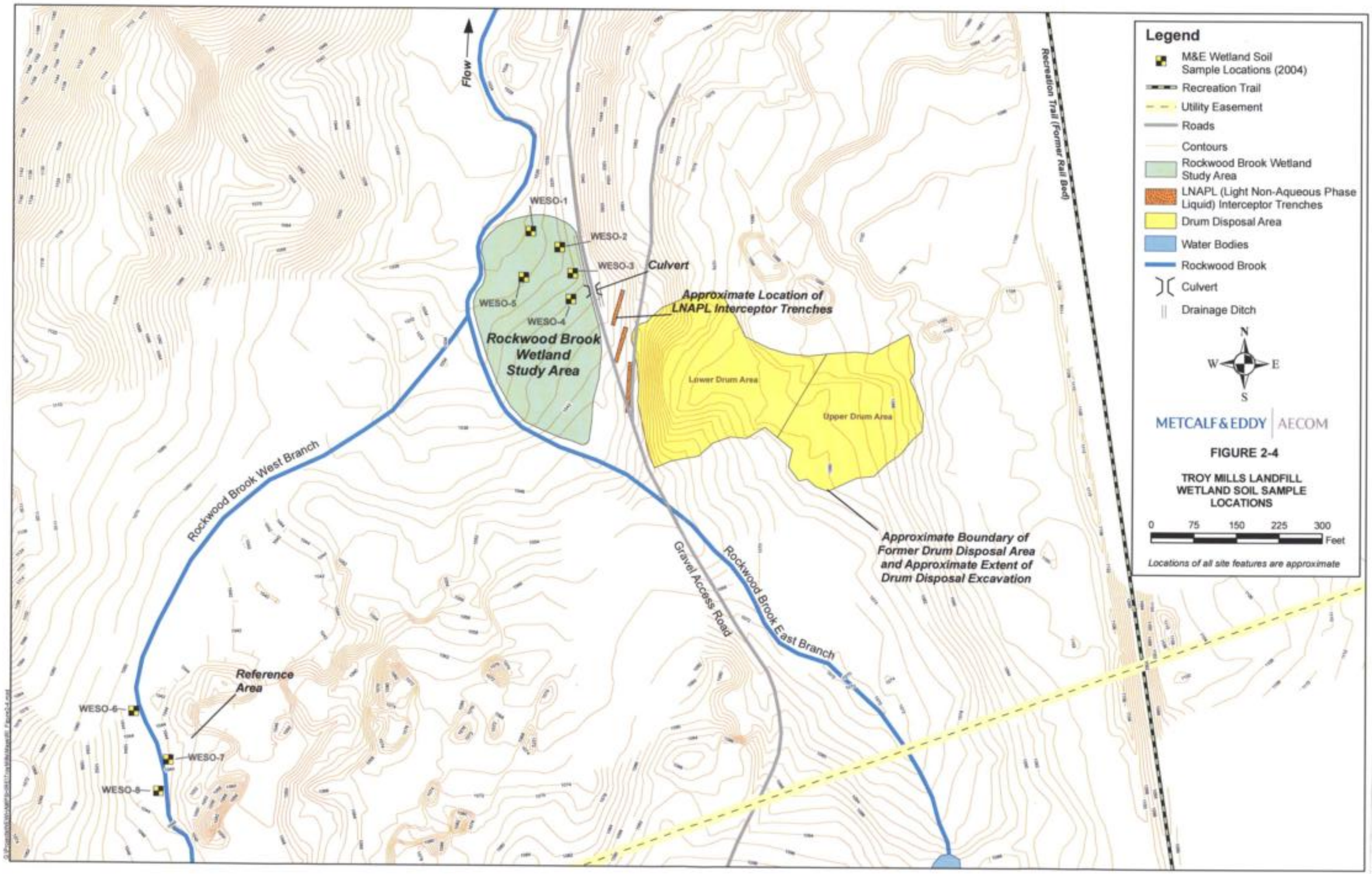
Locations of all site features are approximate

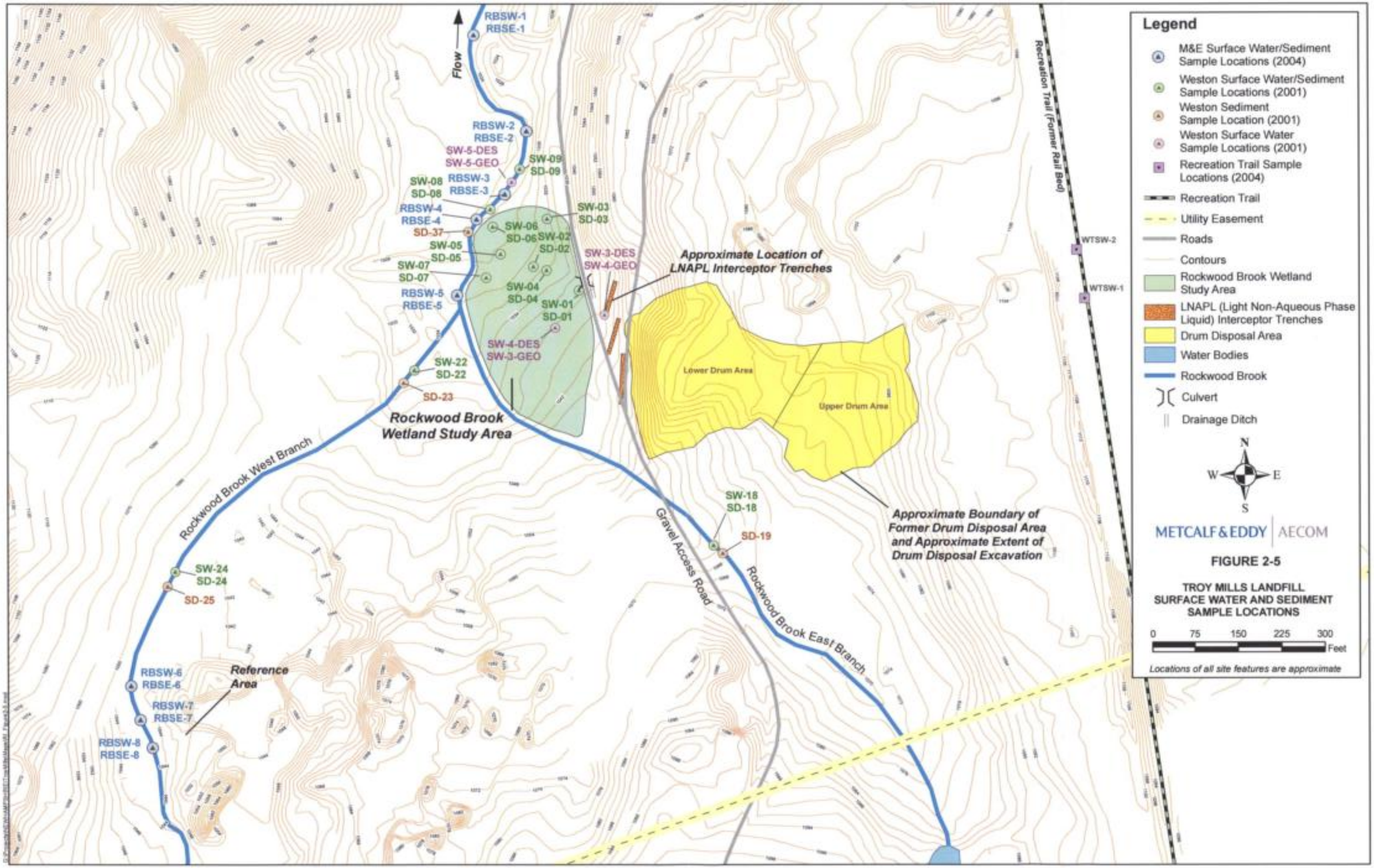

Approximate Location of LNAPL Interceptor Trenches
Culvert
Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation
Rockwood Brook Wetland Study Area
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8
SB-9
SB-10
SB-11
SB-12
Lower Drum Area
Upper Drum Area
Legend
M&E Soil Boring Sample Locations (2005)
Roads
Contours
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 2-1
TROY MILLS LANDFILL
SOIL SAMPLE BORING LOCATIONS
0 25 50 75 100
Feet
Locations of all site features are approximate


Flow
M7D
M7
SWS3
M6
M3
SWS2
MW104S
MW501
MW104D
Culvert
MW201S
MW502
MW201M
MW201D
MW201P
MW503
M2
Rockwood Brook
Wetland Study Area
Approximate Location of
LNAPL Interceptor Trenches
Rockwood Brook West Branch
Rockwood Brook East Branch
MW202P
MW504
MW103
MW108
MW301
MW101
MW203D
MW203S
MW601D
MW203P
MW601S
Lower Drum Area
MW202S
MW202D
MW204
M1
P-1
MW505
SWS1
Gravel Access Road
MW205
MW102
MW602S
MW602B
Upper Drum Area
M5
Recreation Trail (Former Rail Bed)
MW107
MW603
MW506
MW507
MW508
Approximate Boundary of
Former Drum Disposal Area
and Approximate Extent of
Drum Disposal Excavation
Legend
Monitoring Well
Abandoned Monitoring Well
Stream Elevation
Measurement Point (2004)
Recreation Trail
Roads
Contours
Rockwood Brook Wetland
Study Area
LNAPL (Light Non-Aqueous Phase
Liquid) Interceptor Trenches
Drum Disposal Excavation
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 2-2
TROY MILLS LANDFILL
MONITORING WELL LOCATIONS
0
50
100
150
200
Feet
Locations of all site features are approximate
Original includes color coding



Original includes color coding.


Flow
WESO-1
WESO-2
WESO-3
Culvert
WESO-5
WESO-4
Rockwood Brook Wetland Study Area
Approximate Location of LNAPL Interceptor Trenches
Lower Drum Area
Upper Drum Area
Recreation Trail (Former Rail Bed)
Rockwood Brook West Branch
Gravel Access Road
Rockwood Brook East Branch
Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation
Reference Area
WESO-6
WESO-7
WESO-8
Legend
M&E Wetland Soil Sample Locations (2004)
Recreation Trail
Utility Easement
Roads
Contours
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Water Bodies
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 2-4
TROY MILLS LANDFILL
WETLAND SOIL SAMPLE
LOCATIONS
0 75 150 225 300
Feet
Locations of all site features are approximate
Original includes color coding


RBSW-1
RBSE-1
Flow
RBSW-2
RBSE-2
SW-5-DES
SW-5-GEO
SW-09
SD-09
SW-08
SD-08
RBSW-3
RBSE-3
RBSW-4
RBSE-4
SD-37
SW-06
SD-06
SW-02
SD-02
SW-03
SD-03
SW-05
SD-05
SW-07
SD-07
SW-3-DES
SW-4-GEO
Approximate Location of
LNAPL Interceptor Trenches
SW-04
SD-04
RBSW-5
RBSE-5
SW-01
SD-01
SW-4-DES
SW-3-GEO
SW-22
SD-22
SD-23
Rockwood Brook
Wetland Study Area
Lower Drum Area
Upper Drum Area
Recreation Trail (Former Rail Bed)
WTSW-2
WTSW-1
Rockwood Brook West Branch
SW-18
SD-18
SD-19
Gravel Access Road
Approximate Boundary of
Former Drum Disposal Area
and Approximate Extent of
Drum Disposal Excavation
SW-24
SD-24
SD-25
RBSW-6
RBSE-6
Reference
Area
RBSW-7
RBSE-7
RBSW-8
RBSE-8
Rockwood Brook East Branch
Legend
M&E Surface Water/Sediment Sample Locations (2004)
Weston Surface Water/Sediment Sample Locations (2001)
Weston Sediment Sample Location (2001)
Weston Surface Water Sample Locations (2001)
Recreation Trail Sample Locations (2004)
Recreation Trail
Utility Easement
Roads
Contours
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Water Bodies
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 2-5
TROY MILLS LANDFILL
SURFACE WATER AND SEDIMENT
SAMPLE LOCATIONS
0 75 150 225 300
Feet
Locations of all site features are approximate

Flow

Rockwood Brook Wetland Study Area

Culvert

Approximate Location of LNAPL Interceptor Trenches

AR-4

AR-2

AR-3

AR-1

Lower Drum Area

Upper Drum Area

Recreation Trail (Former Rail Bed)

Rockwood Brook West Branch

Rockwood Brook East Branch

Gravel Access Road

Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation

Legend

- M&E Air Quality Sample Locations (2004)
- Recreation Trail
- Roads
- Contours
- Rockwood Brook Wetland Study Area
- LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
- Drum Disposal Area
- Rockwood Brook
- Culvert
- Drainage Ditch

N W E S

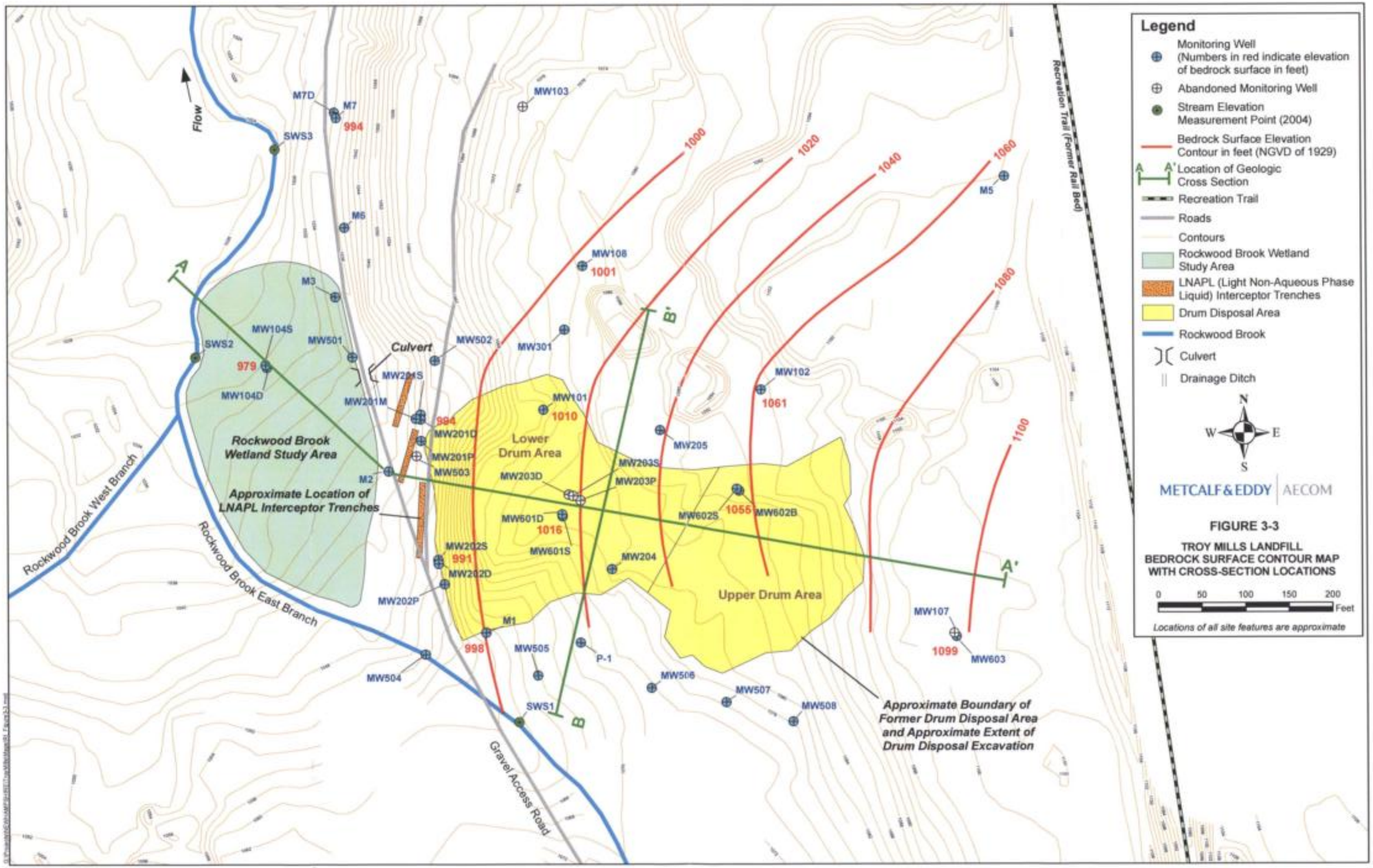
METCALF & EDDY | AECOM

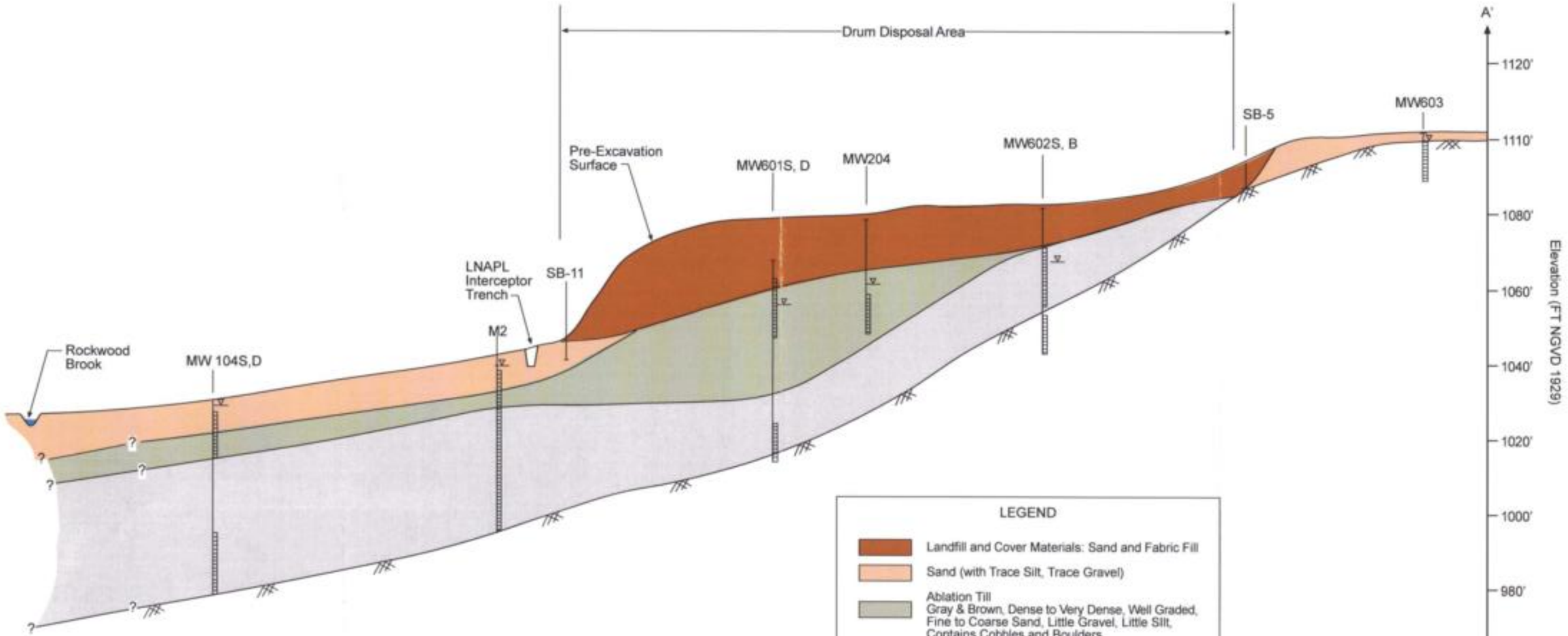
FIGURE 2-6

TROY MILLS LANDFILL
AIR QUALITY SAMPLE LOCATIONS

0 50 100 150 200 Feet

Locations of all site features are approximate


Flow
M7D
M7
994
SWS3
M6
MW103
1000
1020
1040
1060
1080
1100
M5
MW108
1001
M3
MW104S
SWS2
979
MW104D
MW501
Culvert
MW502
MW301
MW201S
MW201M
994
MW201D
MW201P
MW503
M2
Rockwood Brook
Wetland Study Area
Approximate Location of
LNAPL Interceptor Trenches
MW101
1010
Lower
Drum Area
MW205
MW102
1061
MW203S
MW203D
MW203P
MW602S
1055
MW602B
MW601D
1016
MW601S
MW204
MW202S
991
MW202D
MW202P
Upper Drum Area
M1
998
MW505
P-1
MW504
SWS1
MW506
MW507
MW508
MW107
1099
MW603
Rockwood Brook West Branch
Rockwood Brook East Branch
Gravel Access Road
Recreation Trail (Former Rail Bed)
A
A'
B
B'
Approximate Boundary of
Former Drum Disposal Area
and Approximate Extent of
Drum Disposal Excavation
Legend
Monitoring Well
(Numbers in red indicate elevation
of bedrock surface in feet)
Abandoned Monitoring Well
Stream Elevation
Measurement Point (2004)
Bedrock Surface Elevation
Contour in feet (NGVD of 1929)
Location of Geologic
Cross Section
Recreation Trail
Roads
Contours
Rockwood Brook Wetland
Study Area
LNAPL (Light Non-Aqueous Phase
Liquid) Interceptor Trenches
Drum Disposal Area
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 3-3
TROY MILLS LANDFILL
BEDROCK SURFACE CONTOUR MAP
WITH CROSS-SECTION LOCATIONS
0
50
100
150
200
Feet
Locations of all site features are approximate



LEGEND

- Landfill and Cover Materials: Sand and Fabric Fill
- Sand (with Trace Silt, Trace Gravel)
- Ablation Till
  Gray & Brown, Dense to Very Dense, Well Graded, Fine to Coarse Sand, Little Gravel, Little Silt, Contains Cobbles and Boulders
- Basal-Lodgement Till
  Generally a Gray, Very Dense, Well Graded Sandy Silt to Silty Sand w/Gravel & Occasional Cobbles/Boulders
- Weathered Rock or Bedrock (Littleton Formation-Biotite Schist)
- Screened Interval
- Approximate Groundwater Elevation in Well

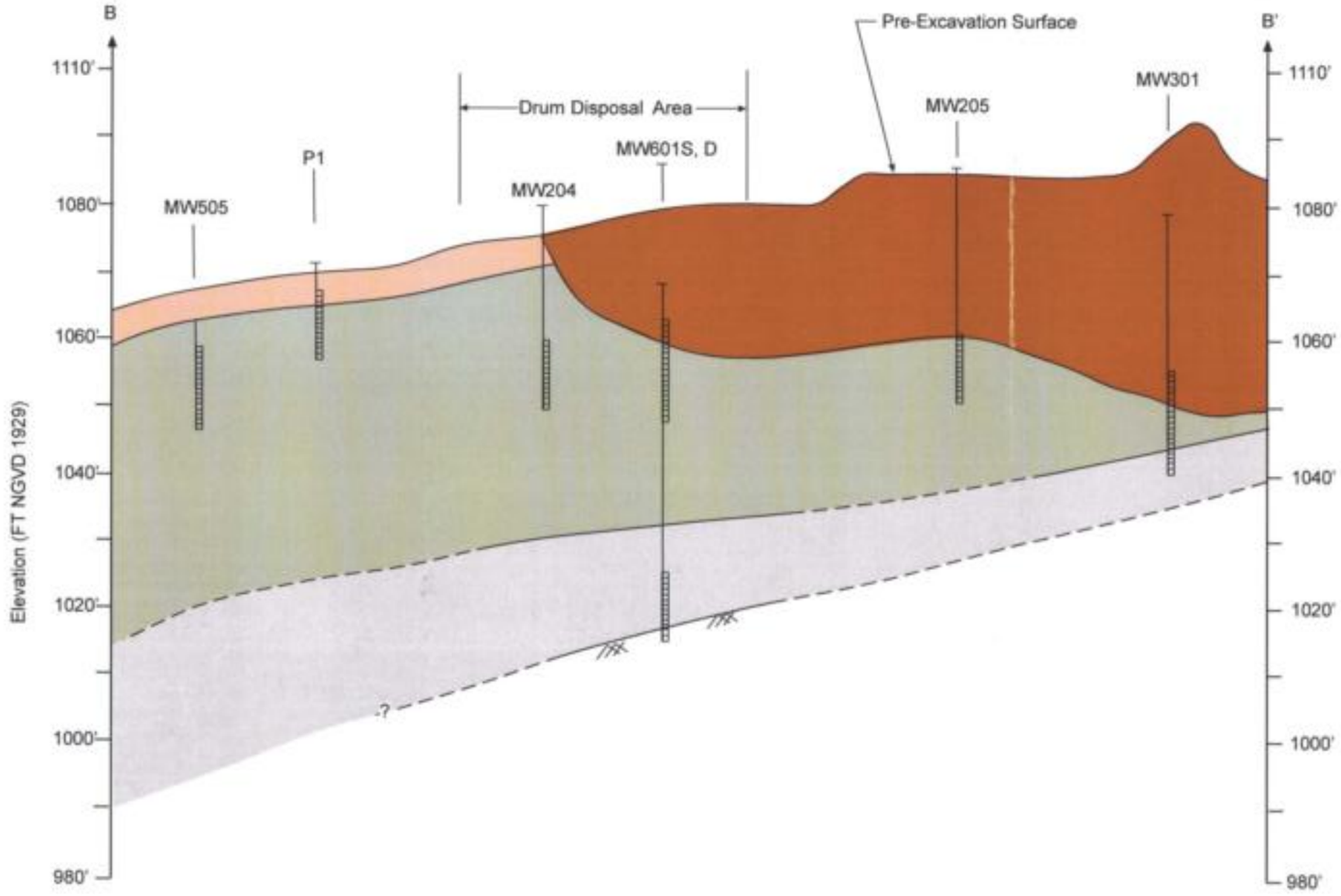
Notes: 1). Stratigraphic Profile Adjusted to Account for Offset Well and Boring Locations
2). The Upper 5 to 15 ft. of Overburden Soils in the Drum Area were Remixed During Excavation Operations

50 0 50
SCALE IN FEET

FIGURE 3-4

TROY MILLS LANDFILL
GEOLOGIC CROSS-SECTION A-A'

01.7437



LEGEND

- Landfill and Cover Materials: Sand and Fabric Fill
- Sand (with Trace Silt, Trace Gravel)
- Ablation Till
  Gray & Brown, Dense to Very Dense, Well Graded, Fine to Coarse Sand, Little Gravel, Little Silt, Contains Cobbles and Boulders
- Basal-Lodgement Till
  Generally a Gray, Very Dense, Well Graded Sandy Silt to Silty Sand w/Gravel & Occasional Cobbles/Boulders
- Weathered Rock or Bedrock (Littleton Formation-Biotite Schist)
- Screened Interval

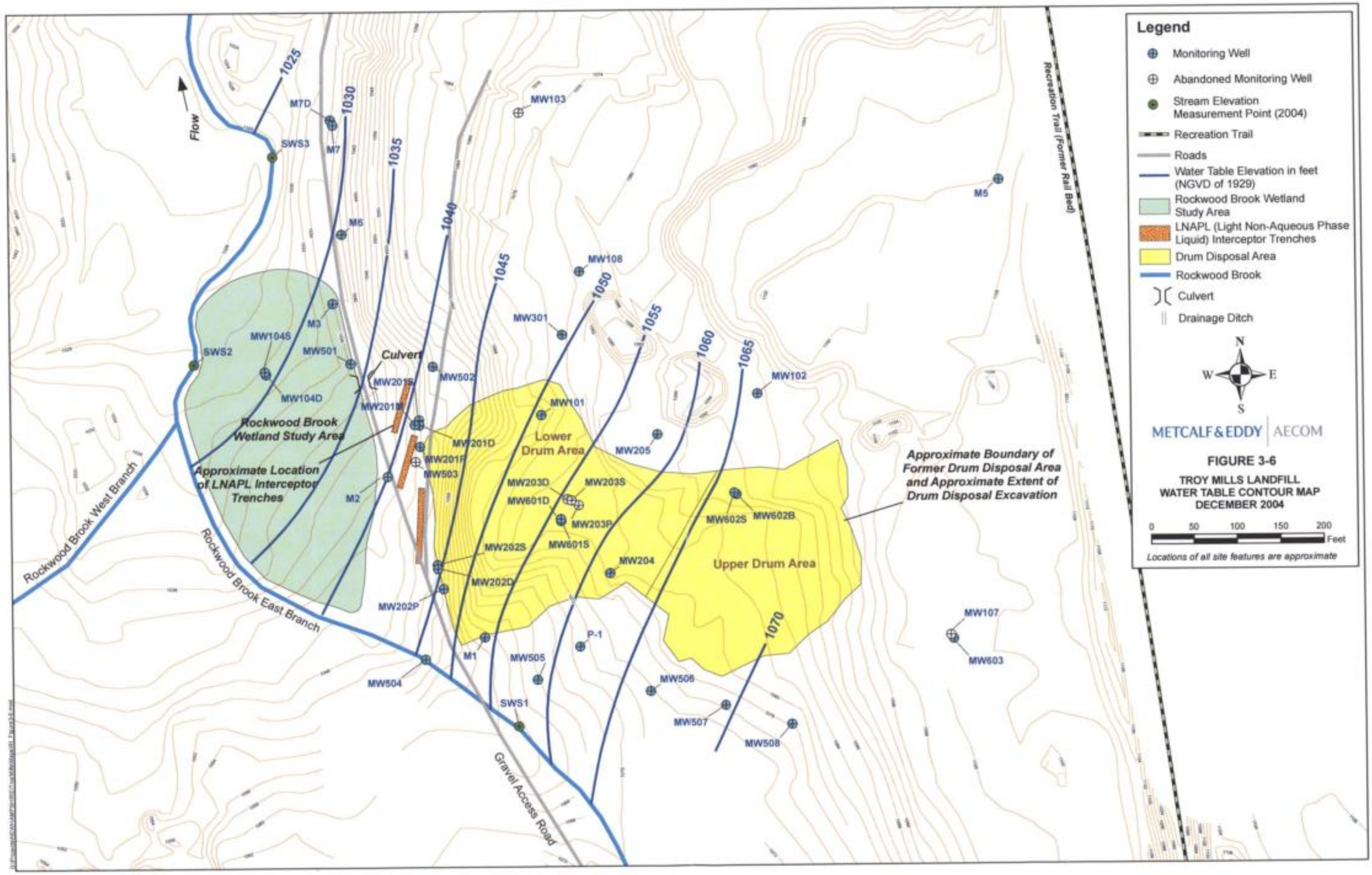
Notes: 1). Stratigraphic Profile Adjusted to Account for Offset Well and Boring Locations
2). The Upper 5 to 15 ft. of Overburden Soils in the Drum Area were Remixed During Excavation Operations

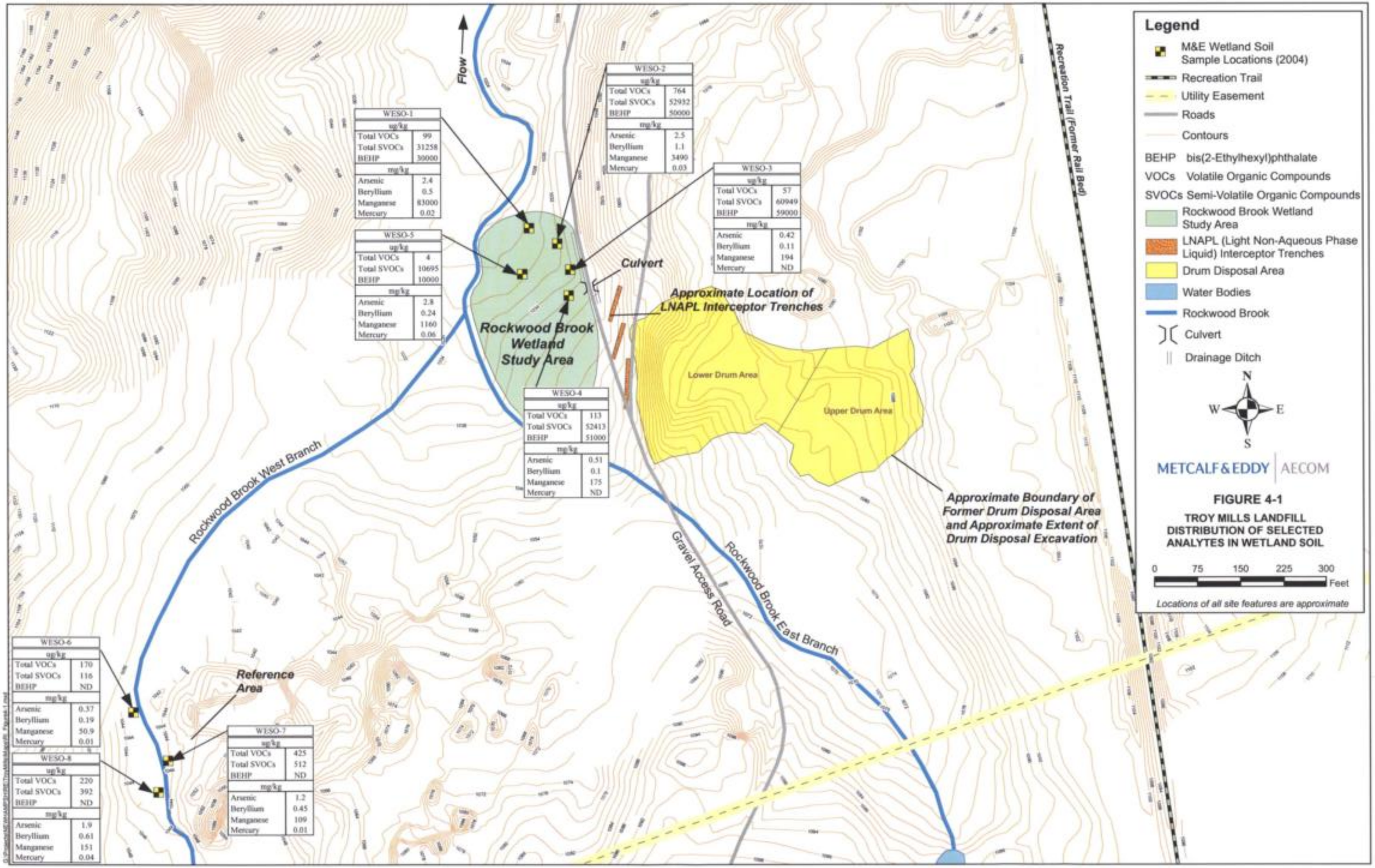
50 0 50
SCALE IN FEET

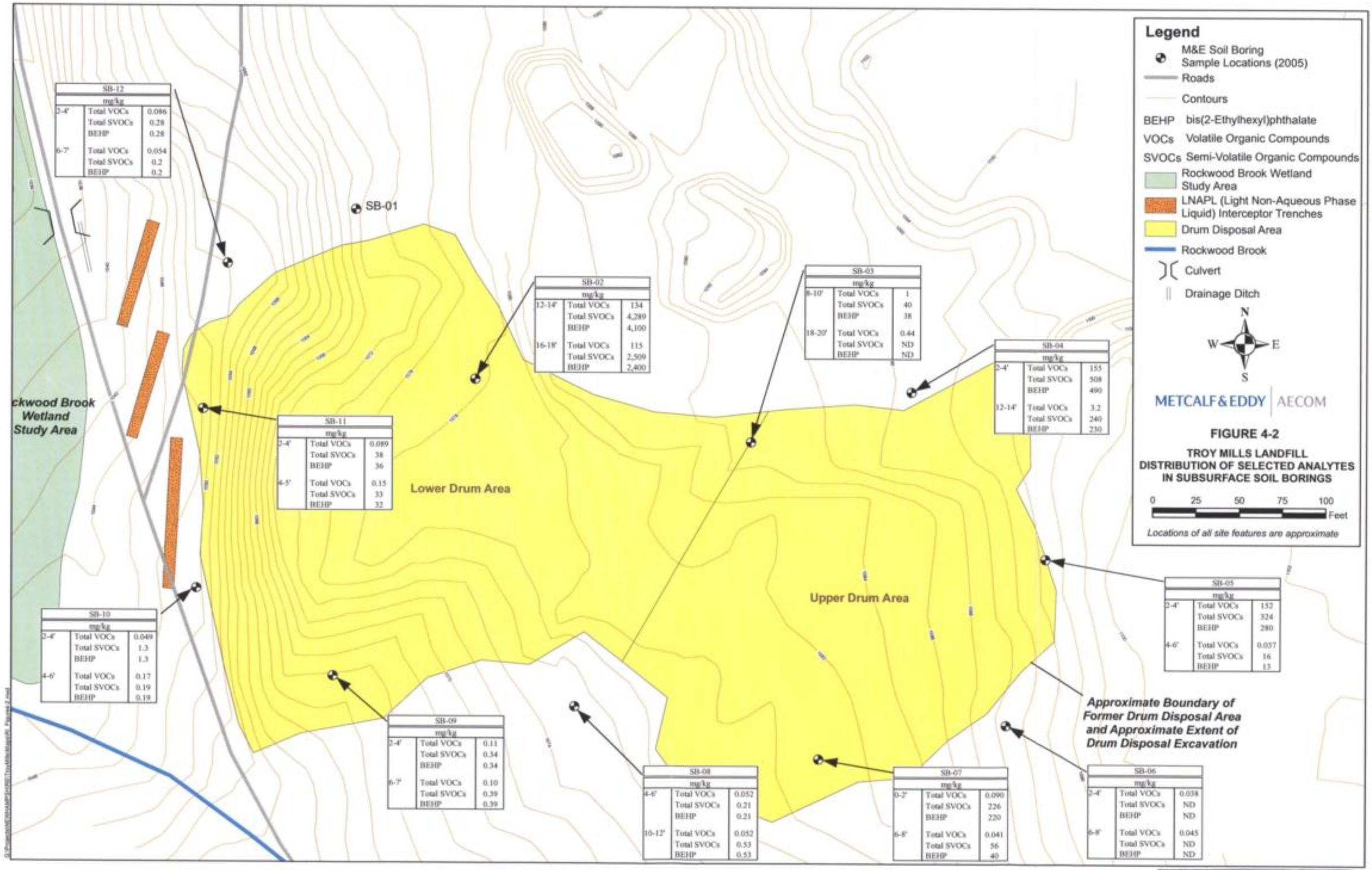
FIGURE 3-5

TROY MILLS LANDFILL
GEOLOGIC CROSS-SECTION B-B'

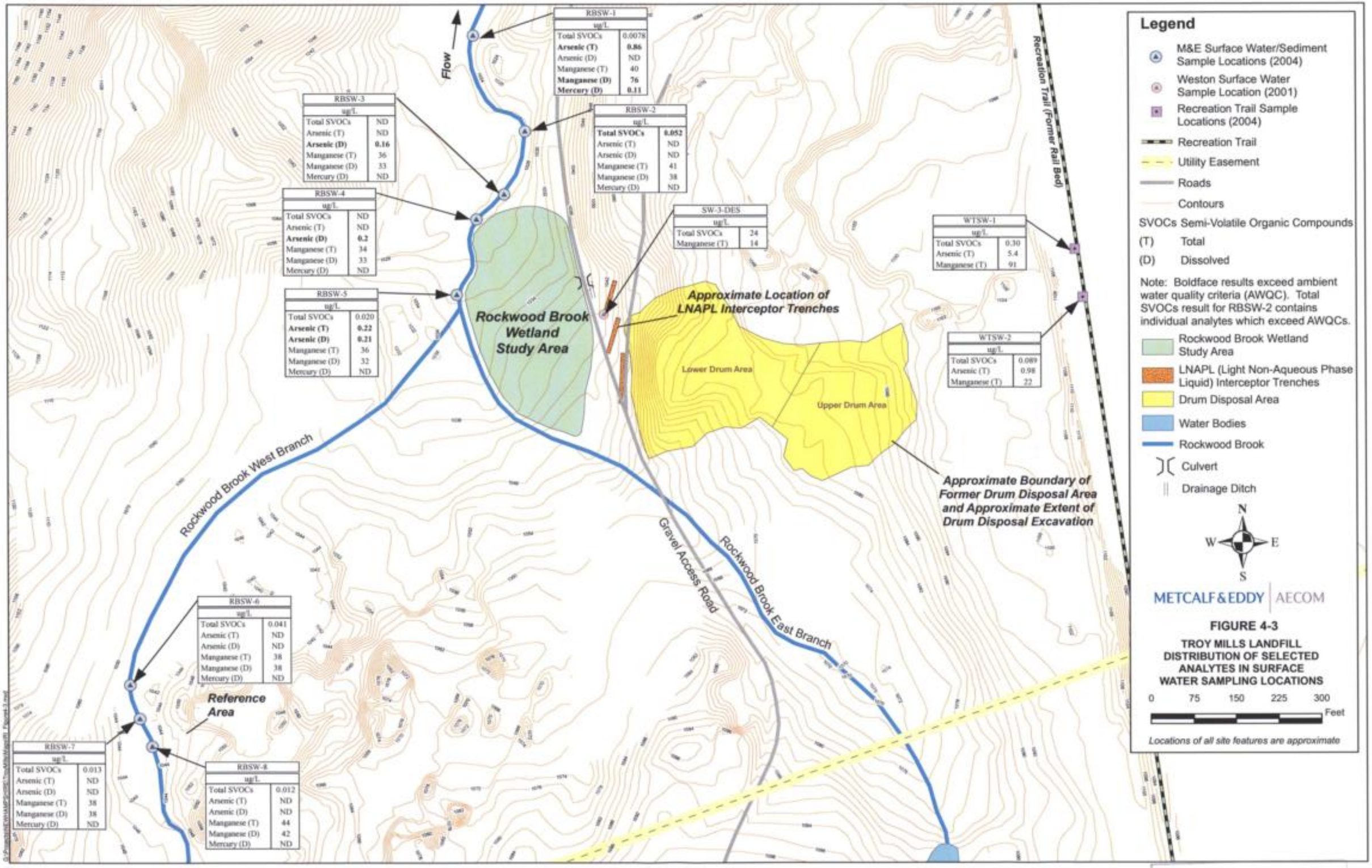
02.7437


Legend
Monitoring Well
Abandoned Monitoring Well
Stream Elevation Measurement Point (2004)
Recreation Trail
Roads
Water Table Elevation in feet (NGVD of 1929)
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 3-6
TROY MILLS LANDFILL
WATER TABLE CONTOUR MAP
DECEMBER 2004
0 50 100 150 200
Feet
Locations of all site features are approximate
Flow
1025
1030
1035
1040
1045
1050
1055
1060
1065
1070
M7D
M7
SWS3
M6
MW103
M5
MW108
MW301
MW102
M3
MW104S
SWS2
MW501
Culvert
MW201S
MW502
MW104D
MW201M
MW101
Rockwood Brook
Wetland Study Area
MW201D
Lower
Drum Area
MW205
MW201P
MW503
Approximate Location
of LNAPL Interceptor
Trenches
M2
MW203D
MW203S
MW601D
MW203P
MW601S
MW602S
MW602B
Approximate Boundary of
Former Drum Disposal Area
and Approximate Extent of
Drum Disposal Excavation
MW202S
MW204
MW202D
Upper Drum Area
MW202P
MW107
MW603
P-1
M1
MW505
MW504
MW506
SWS1
MW507
MW508
Rockwood Brook West Branch
Rockwood Brook East Branch
Gravel Access Road
Recreation Trail (Former Rail Bed)


Flow
WESO-1
ug/kg
Total VOCs 99
Total SVOCs 31258
BEHP 30000
mg/kg
Arsenic 2.4
Beryllium 0.5
Manganese 83000
Mercury 0.02
WESO-2
ug/kg
Total VOCs 764
Total SVOCs 52932
BEHP 50000
mg/kg
Arsenic 2.5
Beryllium 1.1
Manganese 3490
Mercury 0.03
WESO-3
ug/kg
Total VOCs 57
Total SVOCs 60949
BEHP 59000
mg/kg
Arsenic 0.42
Beryllium 0.11
Manganese 194
Mercury ND
WESO-4
ug/kg
Total VOCs 113
Total SVOCs 52413
BEHP 51000
mg/kg
Arsenic 0.51
Beryllium 0.1
Manganese 175
Mercury ND
WESO-5
ug/kg
Total VOCs 4
Total SVOCs 10695
BEHP 10000
mg/kg
Arsenic 2.8
Beryllium 0.24
Manganese 1160
Mercury 0.06
WESO-6
ug/kg
Total VOCs 170
Total SVOCs 116
BEHP ND
mg/kg
Arsenic 0.37
Beryllium 0.19
Manganese 50.9
Mercury 0.01
WESO-7
ug/kg
Total VOCs 425
Total SVOCs 512
BEHP ND
mg/kg
Arsenic 1.2
Beryllium 0.45
Manganese 109
Mercury 0.01
WESO-8
ug/kg
Total VOCs 220
Total SVOCs 392
BEHP ND
mg/kg
Arsenic 1.9
Beryllium 0.61
Manganese 151
Mercury 0.04
Culvert
Approximate Location of LNAPL Interceptor Trenches
Rockwood Brook Wetland Study Area
Lower Drum Area
Upper Drum Area
Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation
Reference Area
Rockwood Brook West Branch
Rockwood Brook East Branch
Gravel Access Road
Recreation Trail (Former Rail Bed)
Legend
M&E Wetland Soil Sample Locations (2004)
Recreation Trail
Utility Easement
Roads
Contours
BEHP bis(2-Ethylhexyl)phthalate
VOCs Volatile Organic Compounds
SVOCs Semi-Volatile Organic Compounds
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Water Bodies
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 4-1
TROY MILLS LANDFILL
DISTRIBUTION OF SELECTED ANALYTES IN WETLAND SOIL
0 75 150 225 300
Feet
Locations of all site features are approximate



Original includes color coding.



Original includes color coding.

RBSE-1	
ug/kg	
Total SVOCs	587
BEHP	360
mg/kg	
Arsenic	0.35
Manganese	56
Mercury	ND

RBSE-2	
ug/kg	
Total SVOCs	50
BEHP	ND
mg/kg	
Arsenic	0.34
Manganese	71
Mercury	ND

RBSE-3	
ug/kg	
Total SVOCs	289
BEHP	223
mg/kg	
Arsenic	0.34
Manganese	72
Mercury	ND

RBSE-4	
ug/kg	
Total SVOCs	47
BEHP	ND
mg/kg	
Arsenic	0.28
Manganese	56
Mercury	ND

RBSE-5	
ug/kg	
Total SVOCs	358
BEHP	310
mg/kg	
Arsenic	0.31
Manganese	103
Mercury	ND

RBSE-6	
ug/kg	
Total SVOCs	38
BEHP	ND
mg/kg	
Arsenic	0.21
Manganese	28
Mercury	ND

RBSE-7	
ug/kg	
Total SVOCs	ND
BEHP	ND
mg/kg	
Arsenic	0.15
Manganese	31
Mercury	ND

RBSE-8	
ug/kg	
Total SVOCs	51
BEHP	ND
mg/kg	
Arsenic	0.13
Manganese	25
Mercury	ND

Flow

Rockwood Brook Wetland Study Area

Approximate Location of LNAPL Interceptor Trenches

Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation

Reference Area

Rockwood Brook West Branch

Rockwood Brook East Branch

Gravel Access Road

Recreation Trail (Former Rail Bed)

Legend

- M&E Sediment Sample Locations (2004)
- Recreation Trail
- Utility Easement
- Roads
- Contours

BEHP bis(2-Ethylhexyl)phthalate

SVOCs Semi-Volatile Organic Compounds

- Rockwood Brook Wetland Study Area
- LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
- Drum Disposal Area
- Water Bodies
- Rockwood Brook
- Culvert
- Drainage Ditch

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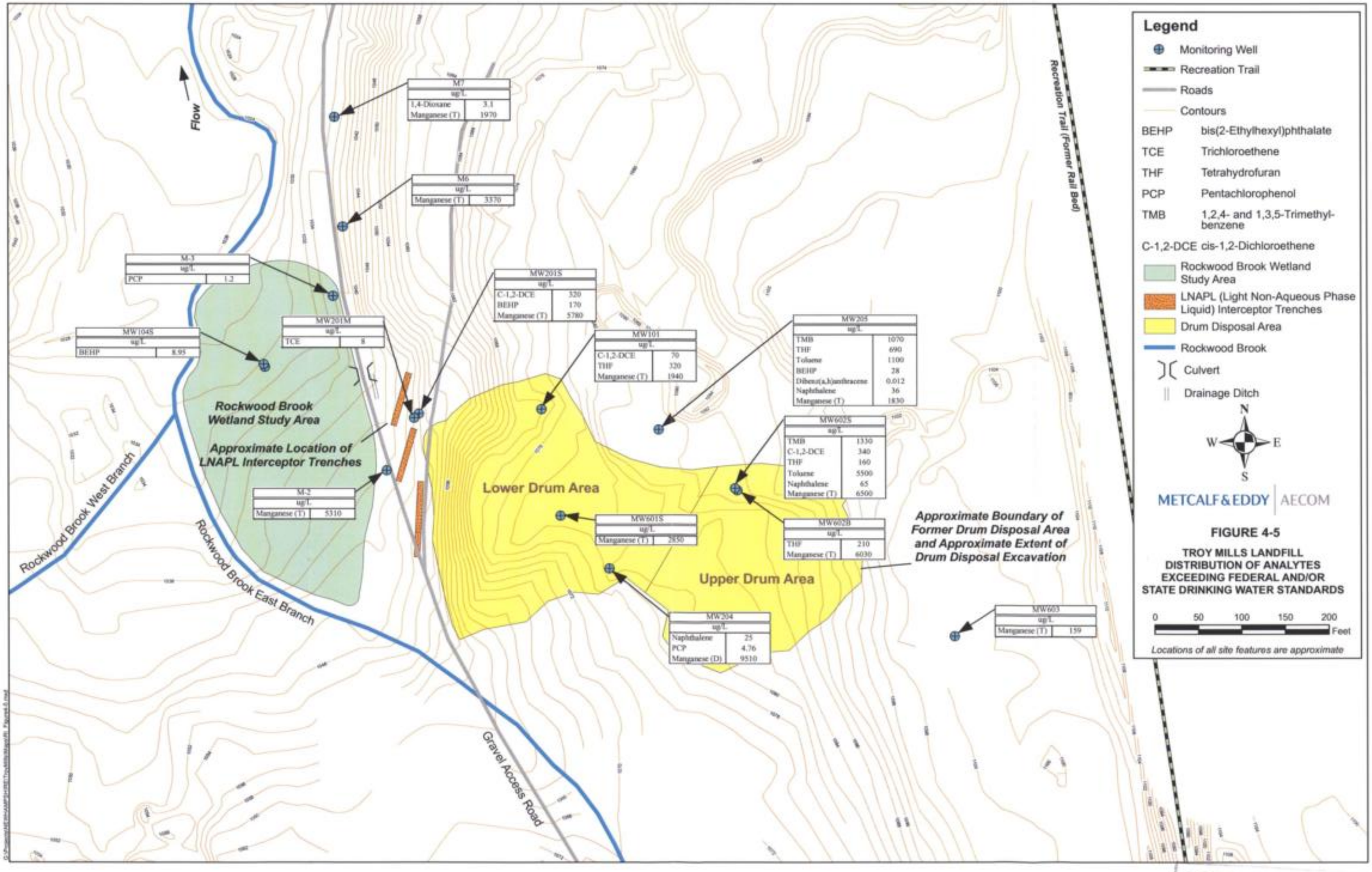
FIGURE 4-4

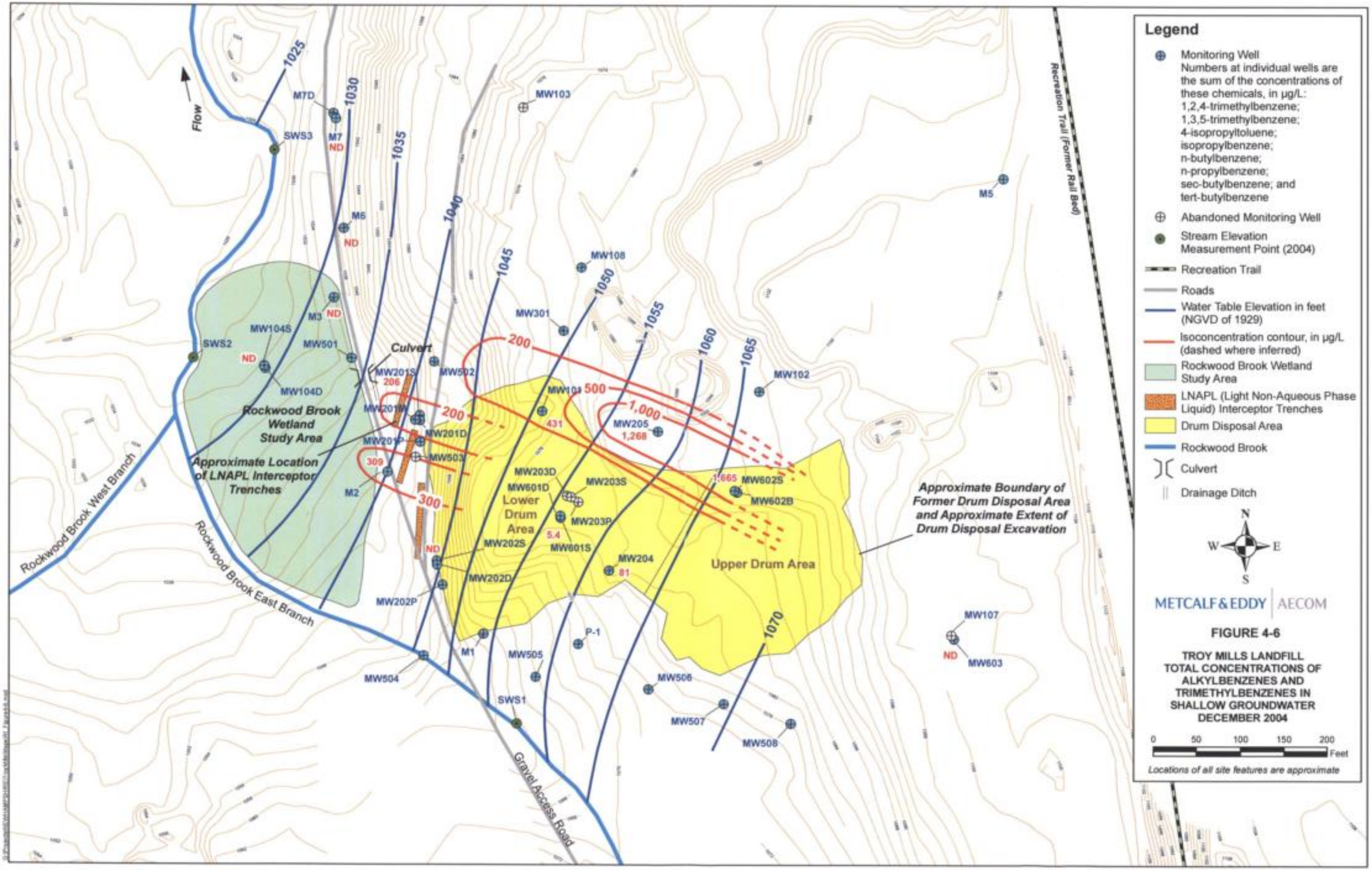
TROY MILLS LANDFILL
DISTRIBUTION OF SELECTED ANALYTES IN SEDIMENT

0 75 150 225 300 Feet

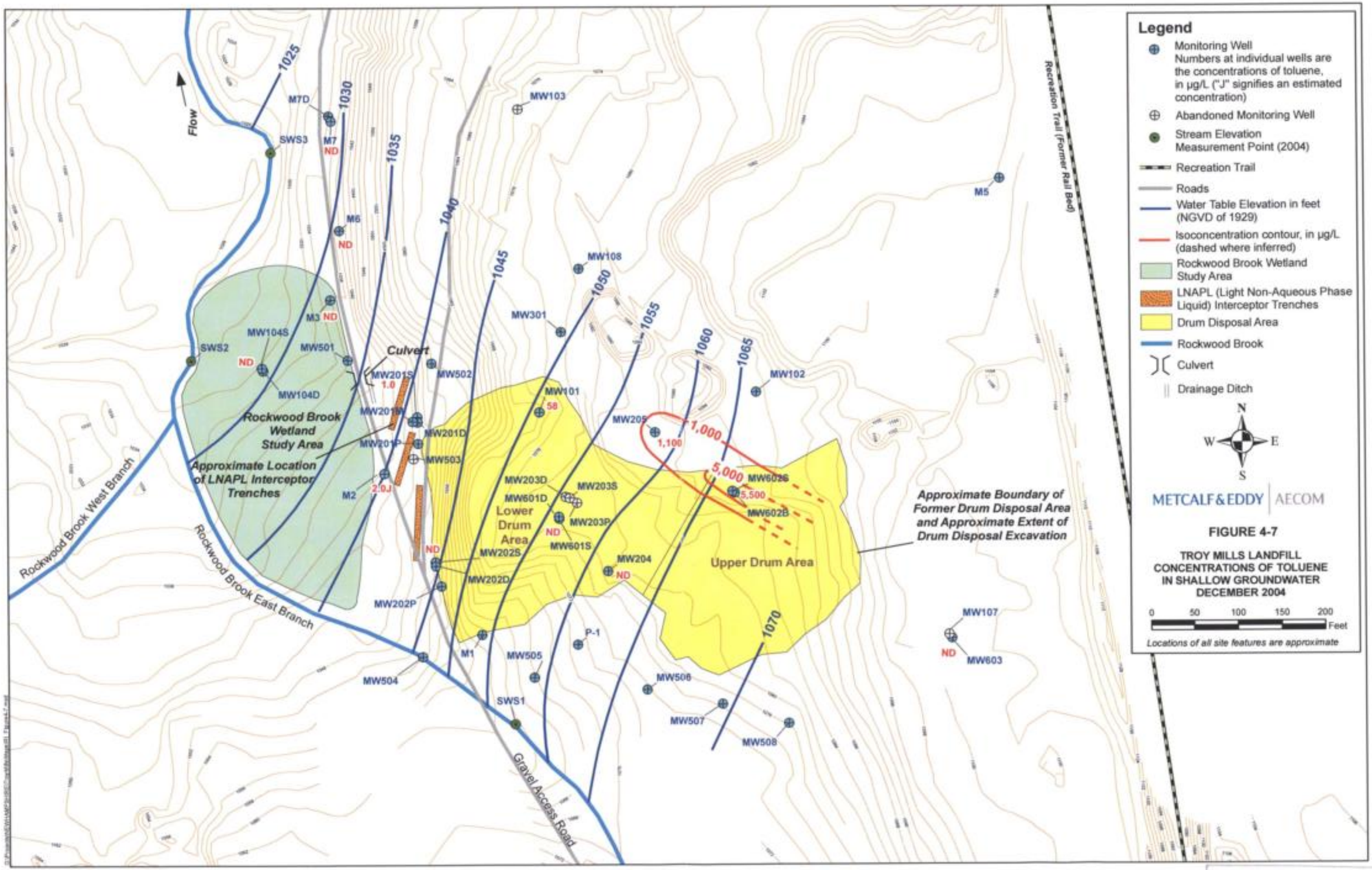
Locations of all site features are approximate

Original includes color coding.


Flow
M7
ug/L
1,4-Dioxane 3.1
Manganese (T) 1970
M6
ug/L
Manganese (T) 3370
M-3
ug/L
PCP 1.2
MW104S
ug/L
BEHP 8.95
MW201M
ug/L
TCE 8
MW201S
ug/L
C-1,2-DCE 320
BEHP 170
Manganese (T) 5780
MW101
ug/L
C-1,2-DCE 70
THF 320
Manganese (T) 1940
MW205
ug/L
TMB 1070
THF 690
Toluene 1100
BEHP 28
Dibenz(a,h)anthracene 0.012
Naphthalene 36
Manganese (T) 1830
MW602S
ug/L
TMB 1330
C-1,2-DCE 340
THF 160
Toluene 5500
Naphthalene 65
Manganese (T) 6500
M-2
ug/L
Manganese (T) 5310
MW601S
ug/L
Manganese (T) 2850
MW602B
ug/L
THF 210
Manganese (T) 6030
MW204
ug/L
Naphthalene 25
PCP 4.76
Manganese (D) 9510
MW603
ug/L
Manganese (T) 159
Rockwood Brook Wetland Study Area
Approximate Location of LNAPL Interceptor Trenches
Lower Drum Area
Upper Drum Area
Approximate Boundary of Former Drum Disposal Area and Approximate Extent of Drum Disposal Excavation
Recreation Trail (Former Rail Bed)
Rockwood Brook West Branch
Rockwood Brook East Branch
Gravel Access Road
Legend
Monitoring Well
Recreation Trail
Roads
Contours
BEHP bis(2-Ethylhexyl)phthalate
TCE Trichloroethene
THF Tetrahydrofuran
PCP Pentachlorophenol
TMB 1,2,4- and 1,3,5-Trimethyl-benzene
C-1,2-DCE cis-1,2-Dichloroethene
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 4-5
TROY MILLS LANDFILL
DISTRIBUTION OF ANALYTES EXCEEDING FEDERAL AND/OR STATE DRINKING WATER STANDARDS
0 50 100 150 200
Feet
Locations of all site features are approximate



Original includes color coding.



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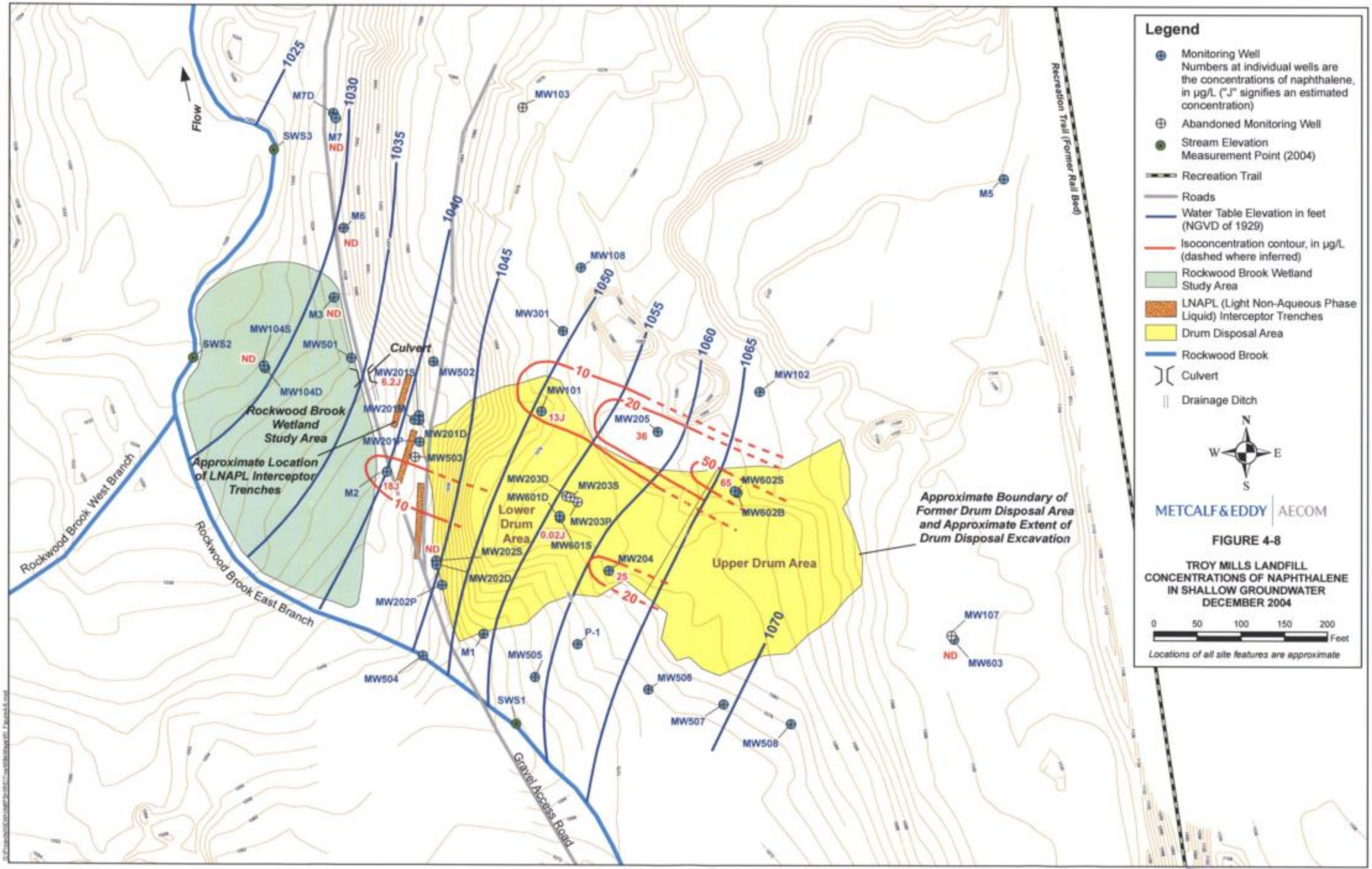
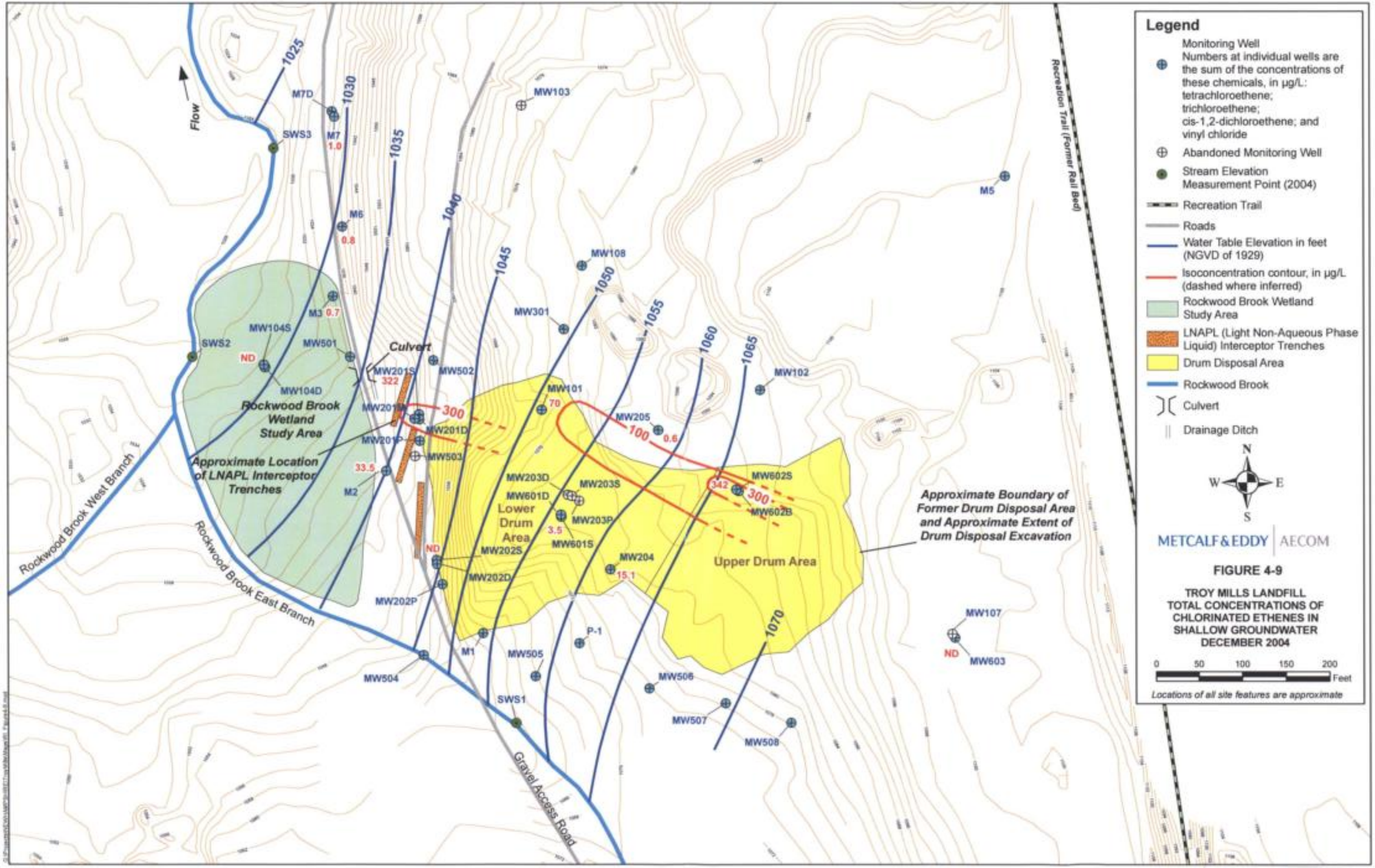


Original includes color coding.



Legend

- Monitoring Well
  Numbers at individual wells are the sum of the concentrations of these chemicals, in µg/L: tetrachloroethene; trichloroethene; cis-1,2-dichloroethene; and vinyl chloride
- Abandoned Monitoring Well
- Stream Elevation Measurement Point (2004)
- Recreation Trail
- Roads
- Water Table Elevation in feet (NGVD of 1929)
- Isoconcentration contour, in µg/L (dashed where inferred)
- Rockwood Brook Wetland Study Area
- LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
- Drum Disposal Area
- Rockwood Brook
- Culvert
- Drainage Ditch

N W E S

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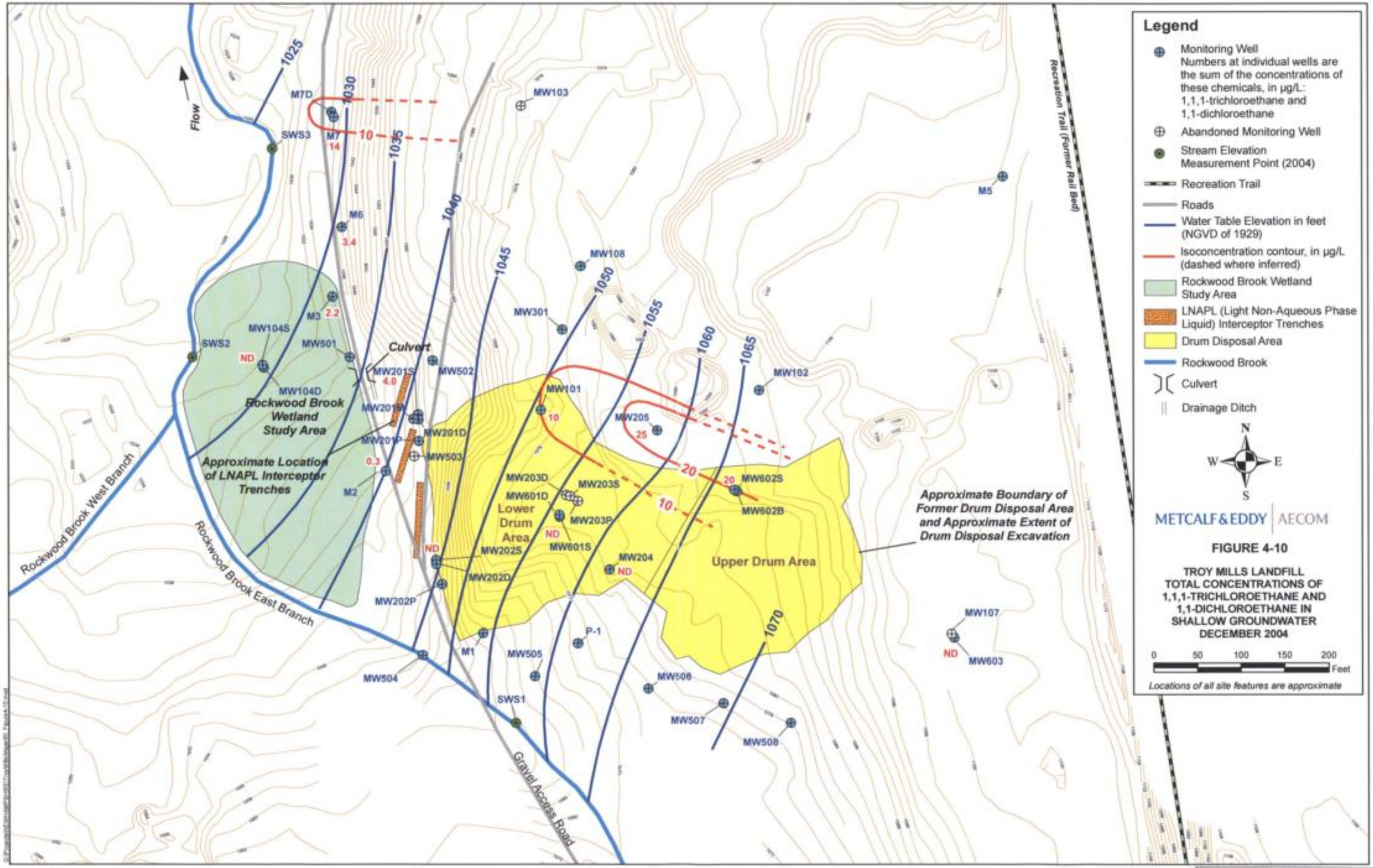
FIGURE 4-9

TROY MILLS LANDFILL
TOTAL CONCENTRATIONS OF CHLORINATED ETHENES IN SHALLOW GROUNDWATER DECEMBER 2004

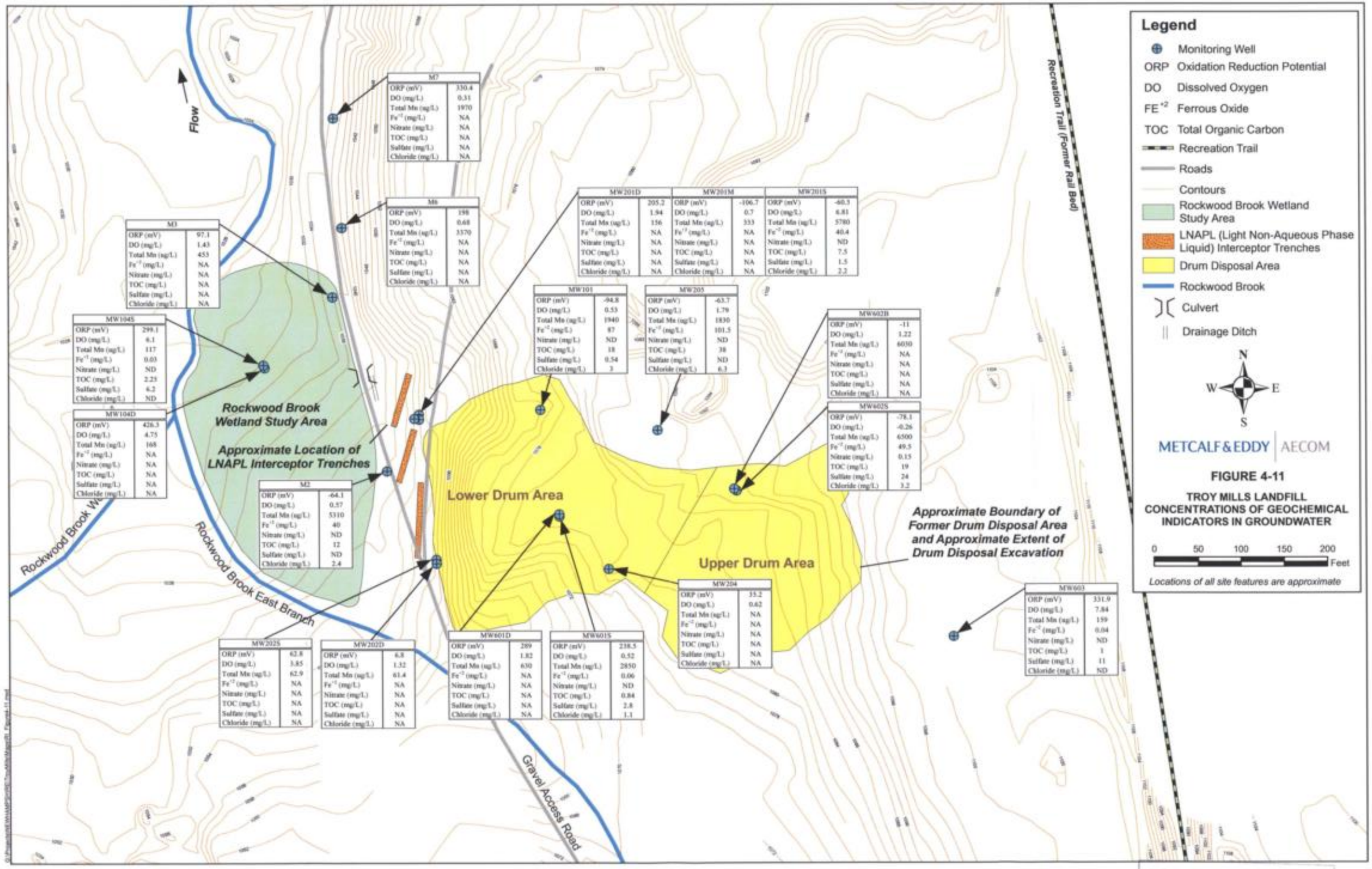
0 50 100 150 200 Feet

Locations of all site features are approximate

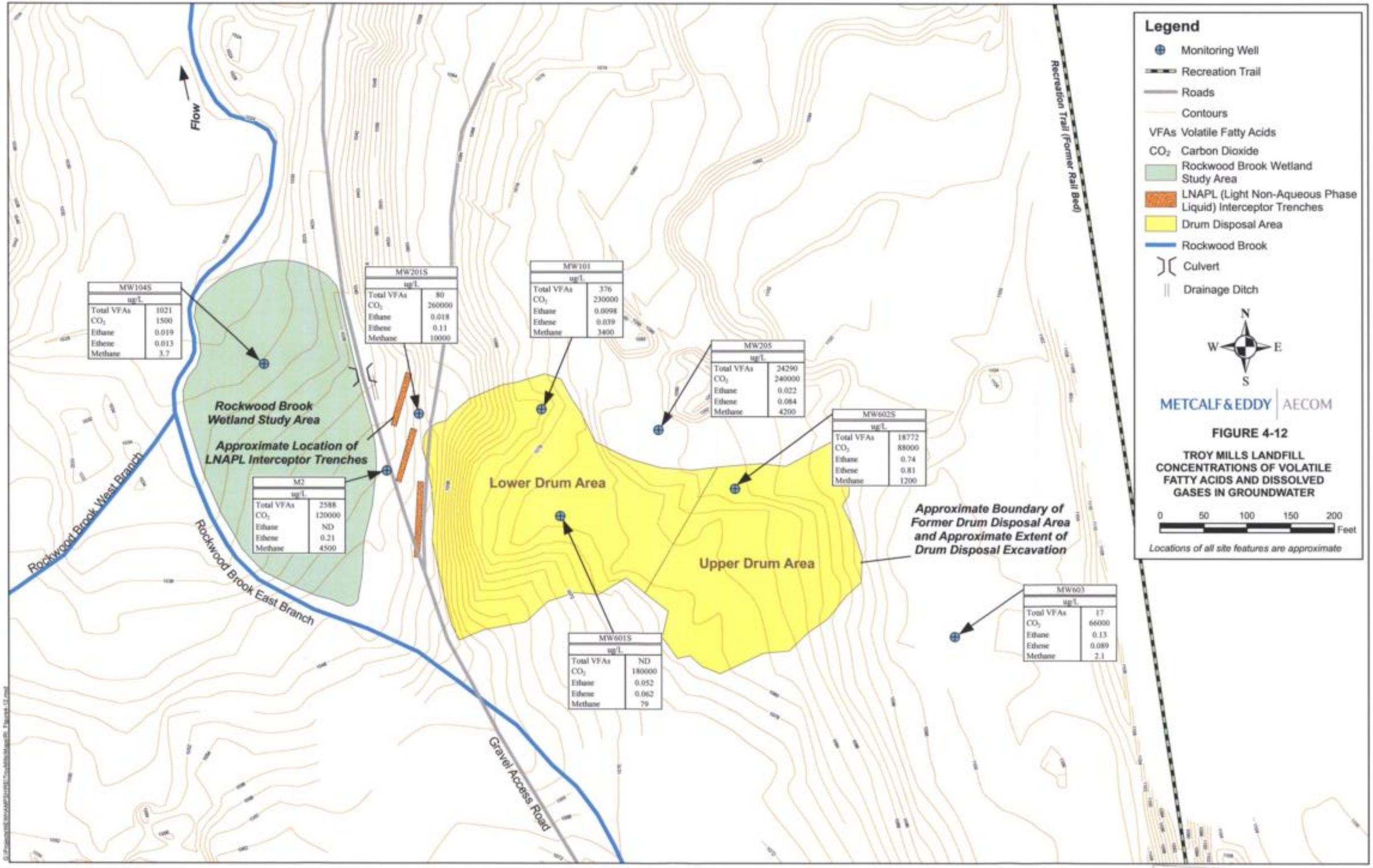
Original includes color coding



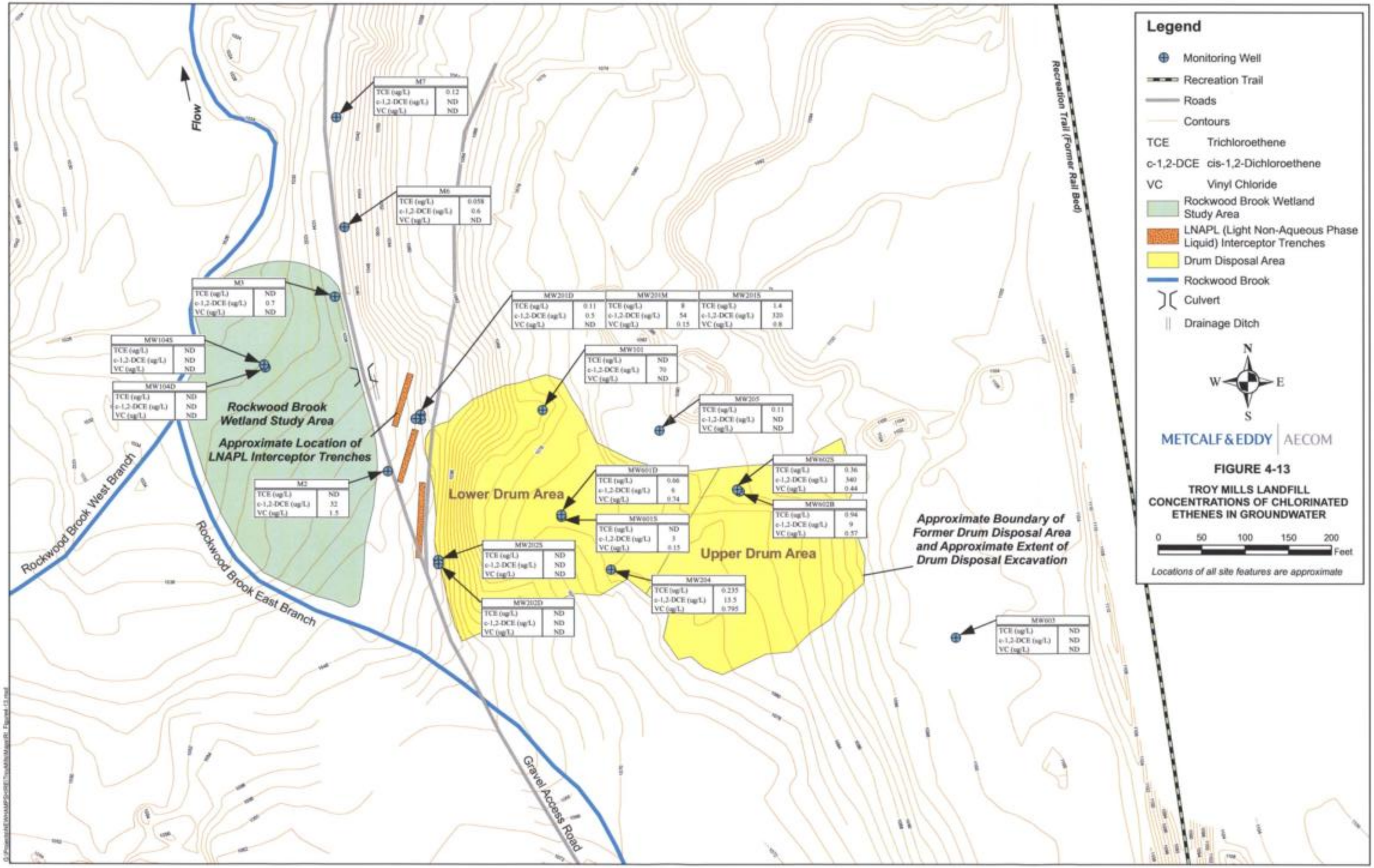
Original includes color coding.



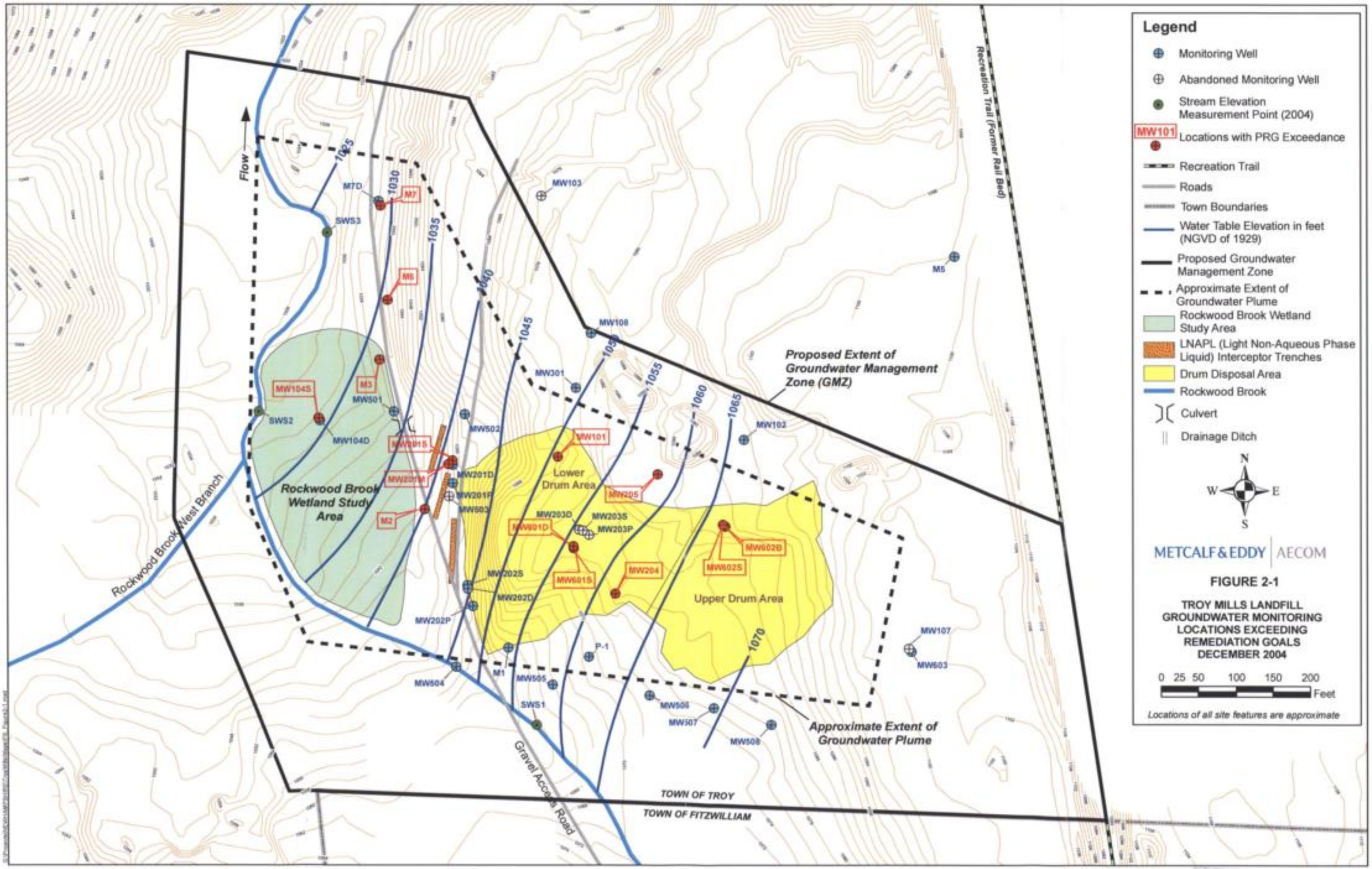
Original includes color coding.



Original includes color coding



Original includes color coding.


Legend
Monitoring Well
Abandoned Monitoring Well
Stream Elevation Measurement Point (2004)
MW101
Locations with PRG Exceedance
Recreation Trail
Roads
Town Boundaries
Water Table Elevation in feet (NGVD of 1929)
Proposed Groundwater Management Zone
Approximate Extent of Groundwater Plume
Rockwood Brook Wetland Study Area
LNAPL (Light Non-Aqueous Phase Liquid) Interceptor Trenches
Drum Disposal Area
Rockwood Brook
Culvert
Drainage Ditch
N
W
E
S
METCALF & EDDY | AECOM
FIGURE 2-1
TROY MILLS LANDFILL
GROUNDWATER MONITORING
LOCATIONS EXCEEDING
REMEDIATION GOALS
DECEMBER 2004
0 25 50 100 150 200
Feet
Locations of all site features are approximate
Flow
1025
1030
1035
1040
1045
1050
1055
1060
1065
1070
M7D
M7
SWS3
M6
MW103
M5
MW108
MW301
MW102
MW104S
M3
MW501
SWS2
MW104D
MW502
MW101
Lower Drum Area
MW201D
MW201M
MW201P
MW503
MW205
M2
MW203D
MW203S
MW203P
MW601D
MW202S
MW202D
MW601S
MW204
MW602B
MW602S
Upper Drum Area
MW202P
P-1
MW107
MW603
M1
MW504
MW505
SWS1
MW506
MW507
MW508
Rockwood Brook Wetland Study Area
Rockwood Brook West Branch
Proposed Extent of Groundwater Management Zone (GMZ)
Approximate Extent of Groundwater Plume
Recreation Trail (Former Rail Bed)
Gravel Access Road
TOWN OF TROY
TOWN OF FITZWILLIAM

TABLES

TABLE 5-2. DETAILED EVALUATION FOR LNAPL
L-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would not provide any protection of human health from risks identified in the human health risk assessment (HHRA). There would be no additional short-term human health risks associated with this alternative.
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). There would be no additional short-term ecological risks associated with this alternative.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	This alternative fails to address risks identified under the chemical-specific ARARs. Refer to Table D-1 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	Since this alternative includes no controls to reduce potential exposures to LNAPL, the residual risk would be the same as those identified in the HHRA.
Adequacy and Reliability of Controls	This alternative does not include any controls to reduce potential future exposures to LNAPL.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.

TABLE 5-2. DETAILED EVALUATION FOR LNAPL
L-1: NO ACTION

SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to the community from the remedy.
Protection of Workers During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to workers from the remedy.
Environmental Impacts	Since this alternative involves no construction or monitoring measures, there would be no adverse, short-term environmental impacts associated with the remedy.
Time to Achieve Remedial Action Objectives	Under this alternative, achieving RAOs would be dependent on natural processes in the subsurface, as well as other remedies implemented at the Site for the other media (e.g., groundwater). Without monitoring it is not possible to assess the criteria.
IMPLEMENTABILITY	
Ability to Construct and Operate	No construction or operation would be performed under this alternative.
Reliability of the Technology	No technologies would be implemented under this alternative.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	No monitoring would be conducted under this alternative. Therefore, the effectiveness would not be evaluated.
Ability to Obtain Approvals and Coordinate with Other Agencies	No approvals would be needed for this alternative.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative.
Availability of Necessary Equipment and Specialists	No equipment or specialists would be needed under this alternative.
Availability of Technology	No technologies would be needed for this alternative.

TABLE 5-2. DETAILED EVALUATION FOR LNAPL
L-1: NO ACTION

COSTS	
Capital Cost	--
Net Present Worth of O&M Costs	--
Net Present Worth of Periodic Costs	$12,400
Total Net Present Worth Cost	$12,400

TABLE 5-3. DETAILED EVALUATION FOR LNAPL
L-2: MAINTAIN LNAPL INTERCEPTOR TRENCHES

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would limit human direct contact exposure to LNAPL. Short-term human health risks associated with environmental monitoring and LNAPL removal/disposal would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). The interceptor trenches have already been installed, so there would be no short-term impacts to ecological habitat under this alternative.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical-, location-, and action-specific ARARs would be complied with. Refer to Table D-2 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	Regular maintenance of the system would be expected to continue providing protection against direct contact exposure to contaminants in the LNAPL.
Adequacy and Reliability of Controls	Interceptor trenches are often used to collect LNAPL at other sites. They are known to be reliable in most situations. Regular upkeep of the system would be required to maintain that reliability.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	Although final disposition of LNAPL may include off-Site treatment rather than, or along with, disposal, treatment processes have not been assumed as primary components of the remedy.
Amount Destroyed or Treated	Although final disposition of LNAPL may include off-Site treatment rather than, or along with, disposal, treatment processes have not been assumed as primary components of the remedy.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	Although final disposition of LNAPL may include off-Site treatment rather than, or along with, disposal, treatment processes have not been assumed as primary components of the remedy.
Degree to which Treatment is Irreversible	Although final disposition of LNAPL may include off-Site treatment rather than, or along with, disposal, treatment processes have not been assumed as primary components of the remedy.

TABLE 5-3. DETAILED EVALUATION FOR LNAPL
L-2: MAINTAIN LNAPL INTERCEPTOR TRENCHES

EVALUATION CRITERIA	DETAILED ANALYSIS
Type and Quantity of Residuals Remaining after Treatment	Although final disposition of LNAPL may include off-Site treatment rather than, or along with, disposal, treatment processes have not been assumed as primary components of the remedy.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Environmental monitoring and a periodic vacuum truck entering the Site would not be expected to create additional short-term risks to the community.
Protection of Workers During Remedial Actions	Short-term worker risks associated with LNAPL collection and environmental monitoring would be mitigated through the use of proper PPE.
Environmental Impacts	Short-term impacts to ecological habitat would not be expected under this alternative.
Time to Achieve Remedial Action Objectives	As interceptor trenches have already been installed, RAOs would be achieved upon removal of all LNAPL from the trenches (likely less than five years).
IMPLEMENTABILITY	
Ability to Construct and Operate	This alternative has already been constructed.
Reliability of the Technology	Data collected to date has shown this technology to be reliable.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	Monitoring in the trenches would be conducted to evaluate the effectiveness of the remedy.
Ability to Obtain Approvals and Coordinate with Other Agencies	Coordination with other agencies has been performed already.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Multiple facilities would be able to accept the LNAPL for final disposition.
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the services needed.
Availability of Technology	This alternative has already been constructed. There are multiple readily-available technologies for collecting the LNAPL from the trenches

TABLE 5-3. DETAILED EVALUATION FOR LNAPL
L-2: MAINTAIN LNAPL INTERCEPTOR TRENCHES

COSTS	
Capital Cost	$10,800
Net Present Worth of O&M Costs	$560,467
Net Present Worth of Periodic Costs	$16,236
Total Net Present Worth Cost	$587,503

TABLE 5-4. DETAILED EVALUATION FOR LNAPL
L-3: EXTRACTION OF LNAPL

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would limit human direct contact exposure to LNAPL contaminants. Short-term human health risks associated with collection/treatment system installation/operation and environmental monitoring would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). Short-term, minor impacts to ecological habitat due to collection/treatment system installation would occur. Potential changes to Site hydrology may impact the adjacent wetland.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical-, location-, and action-specific ARARs would be complied with. Refer to Table D-3 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	The collection system would be expected to significantly reduce or eliminate the contaminant discharge to the Rockwood Brook wetlands, thereby reducing direct contact exposure to leachate contaminants.
Adequacy and Reliability of Controls	Extraction wells are reliable for limiting migration and collecting contaminated groundwater/LNAPL.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	For costing purposes, assumed treatment processes include an oil/water separator, precipitation, and UV/chemical oxidation. The pre-remedial study will determine if other processes are more appropriate.
Amount Destroyed or Treated	As source control actions have recently been completed, an estimate of LNAPL to be collected cannot be made at this time. The estimated collection system flow rate would be 5 gallons per minute.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	Following collection, LNAPL would be separated from the contaminated groundwater. The LNAPL would be shipped off-Site for treatment and/or disposal. Therefore, the treatment system would not reduce the toxicity or volume of the LNAPL. Dissolved-phase contaminants in the groundwater would be treated by technologies which, in some cases, fully destroy the contaminants (some organics via UV/chemical oxidation). Metals would be primarily removed through precipitation methods, so toxicity of the dissolved-phase metals is reduced.

TABLE 5-4. DETAILED EVALUATION FOR LNAPL
L-3: EXTRACTION OF LNAPL

EVALUATION CRITERIA	DETAILED ANALYSIS
Degree to which Treatment is Irreversible	With respect to the treatment processes, the system is irreversible. In looking at the extraction/treatment remedy as a whole, a shut down of the system would not create a situation where the Site returns to original conditions. Whatever would be removed and treated would irreversibly reduce contaminant contribution to risk.
Type and Quantity of Residuals Remaining after Treatment	As source control actions have recently been completed, estimates of residuals cannot be made until pre-remedial studies are performed. Treatment residuals potentially include the collected LNAPL and metals sludges.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Short-term community risks associated with remedy construction, operation, and environmental monitoring would be minor. These impacts would be mitigated as necessary.
Protection of Workers During Remedial Actions	Short-term worker risks associated with remedy construction, operation, and environmental monitoring would be mitigated through the use of proper PPE.
Environmental Impacts	Short-term, minor impacts to ecological habitat due to collection/treatment system installation would occur, but would be mitigated as necessary.
Time to Achieve Remedial Action Objectives	RAOs for LNAPL would be achieved upon removal of all LNAPL from the groundwater (likely less than five years).
IMPLEMENTABILITY	
Ability to Construct and Operate	Extraction and treatment systems are common and easy to implement/operate.
Reliability of the Technology	The technologies utilized are known to be reliable.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	Downgradient monitoring would be conducted to evaluate the effectiveness of the remedy.
Ability to Obtain Approvals and Coordinate with Other Agencies	Approvals for final water disposition (reinjection into groundwater or discharge to surface water) would require coordination with other agencies.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Multiple facilities would be able to accept the treatment residuals for final disposition.

TABLE 5-4. DETAILED EVALUATION FOR LNAPL
L-3: EXTRACTION OF LNAPL

EVALUATION CRITERIA	DETAILED ANALYSIS
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the equipment and services required by this alternative.
Availability of Technology	This alternative contains commonly-used technologies.
COSTS	
Capital Cost	$1,105,931
Net Present Worth of O&M Costs	$1,061,912
Net Present Worth of Periodic Costs	$50,578
Total Net Present Worth Cost	$2,218,421

TABLE 5-5. DETAILED EVALUATION FOR GROUNDWATER
GW-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would not provide any protection of human health from risks identified in the human health risk assessment (HHRA). There would be no additional short-term human health risks associated with this alternative.
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). There would be no additional short-term ecological risks associated with this alternative.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	Under current conditions, chemical-specific ARARs for groundwater have not been met. Therefore, this alternative would not meet ARARs. Refer to Table D-4 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	Since this alternative includes no controls to reduce potential ingestion exposures of groundwater, the residual risk would be the same as that identified in the HHRA. Even though natural degradation processes would reduce the levels of groundwater contamination, the magnitude of that reduction would not be determined because this alternative does not include monitoring.
Adequacy and Reliability of Controls	This alternative does not include any controls to reduce potential future exposures to groundwater.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.

TABLE 5-5. DETAILED EVALUATION FOR GROUNDWATER
GW-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to the community from the remedy.
Protection of Workers During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to workers from the remedy.
Environmental Impacts	Since this alternative involves no construction or monitoring measures, there would be no adverse, short-term environmental impacts associated with the remedy.
Time to Achieve Remedial Action Objectives	Under this alternative, achieving RAOs would be dependent on natural processes in the subsurface. Without monitoring it is not possible to assess the criteria.
IMPLEMENTABILITY	
Ability to Construct and Operate	No construction or operation would be performed under this alternative.
Reliability of the Technology	No technologies would be implemented under this alternative.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	No monitoring would be conducted under this alternative. Therefore, the effectiveness would not be evaluated.
Ability to Obtain Approvals and Coordinate with Other Agencies	No approvals would likely be needed for this alternative.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative.
Availability of Necessary Equipment and Specialists	No equipment or specialists would be needed under this alternative.
Availability of Technology	No technologies would be needed for this alternative.

TABLE 5-5. DETAILED EVALUATION FOR GROUNDWATER
GW-1: NO ACTION

COSTS	
Capital Cost	--
Net Present Worth of O&M Costs	--
Net Present Worth of Periodic Costs	$12,400
Total Net Present Worth Cost	$12,400

TABLE 5-6. DETAILED EVALUATION FOR GROUNDWATER
GW-2: MONITORED NATURAL ATTENUATION

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would eliminate potential human ingestion exposure to groundwater as a potable water supply so long as ICs are enforced. Natural attenuation processes will achieve unrestricted groundwater use standards over time. Short-term human health risks associated with monitoring well installation and environmental monitoring would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). Short-term, minor impacts to ecological habitat due to monitoring well installation and environmental monitoring would occur.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical-, location-, and action-specific ARARs would be complied with. Refer to Table D-5 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	As source control actions have recently been completed, an estimate of the residual risk at the beginning of the remedial action is difficult. However, dissolved-phase contaminants above PRGs are expected to exist during the time period when MNA would be functioning. ICs would be implemented as further protection against accessing the groundwater as a potable water supply and would be maintained until all groundwater cleanup standards are achieved.
Adequacy and Reliability of Controls	MNA is appropriate for many of the Site groundwater contaminants. Adequacy will be determined through long-term monitoring. ICs are reliable if properly enforced.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.

TABLE 5-6. DETAILED EVALUATION FOR GROUNDWATER GW-2: MONITORED NATURAL ATTENUATION

EVALUATION CRITERIA	DETAILED ANALYSIS
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Short-term community risks associated with environmental monitoring would be minor.
Protection of Workers During Remedial Actions	Short-term worker risks associated with well installation and environmental monitoring would be mitigated through the use of proper PPE.
Environmental Impacts	Short-term, minor impacts to ecological habitat due to monitoring well installation and environmental monitoring would occur.
Time to Achieve Remedial Action Objectives	RAOs associated with groundwater ingestion and migration beyond the groundwater management zone would be assumed to be achieved upon implementation of ICs (likely less than one year). Monitoring of discharge to the Rockwood Brook Wetland Study Area would need to be performed to determine if the final groundwater RAO (regarding contamination of other areas of concern) is attained (likely less than five years).
IMPLEMENTABILITY	
Ability to Construct and Operate	MNA is now common and easy to implement.
Reliability of the Technology	MNA can be reliable for many contaminants. Site monitoring will determine if all of the Site groundwater contaminant concentrations would be reduced below PRGs by this technology over time.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	Multiple monitoring locations would be sampled to evaluate the effectiveness of the remedy.
Ability to Obtain Approvals and Coordinate with Other Agencies	ICs would require coordination with other agencies.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative.
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the equipment and services required by this alternative.

TABLE 5-6. DETAILED EVALUATION FOR GROUNDWATER
GW-2: MONITORED NATURAL ATTENUATION

EVALUATION CRITERIA	DETAILED ANALYSIS
Availability of Technology	MNA does not require special technologies.
COSTS	
Capital Cost	$38,361
Net Present Worth of O&M Costs	$2,276,273
Net Present Worth of Periodic Costs	$32,637
Total Net Present Worth Cost	$2,347,271

TABLE 5-7. DETAILED EVALUATION FOR GROUNDWATER
GW-3: MNA WITH IN-SITU TREATMENT

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would eliminate potential human ingestion exposure to groundwater as a potable water supply so long as ICs are enforced. In-Situ Treatment with Monitored Natural Attenuation will achieve unrestricted groundwater use standards over time. Short-term human health risks associated with monitoring well installation, in-situ process installation/operation, and environmental monitoring would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). Short-term, minor impacts to ecological habitat due to monitoring well installation, in-situ process installation, and environmental monitoring would occur.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical-, location-, and action-specific ARARs would be complied with. Refer to Table D-6 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	As source control actions have recently been completed, an estimate of the residual risk at the beginning of the remedial action is difficult. However, dissolved-phase contaminants above PRGs are expected to exist during the time period when MNA and the other in-situ processes would be functioning. ICs would be implemented as further protection against accessing the groundwater as a potable water supply and would be maintained until all groundwater cleanup standards are achieved.
Adequacy and Reliability of Controls	MNA is appropriate for many of the Site groundwater contaminants. Other in-situ processes would be utilized to improve the adequacy and reliability of the remedy. ICs are reliable if properly enforced.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	Appropriate in-situ treatment processes (to be determined during pre-remedial studies) would be utilized to treat groundwater under this alternative.
Amount Destroyed or Treated	Appropriate in-situ treatment processes (to be determined during pre-remedial studies) would be utilized to treat most of the groundwater contaminants. Many of the contaminants would be reduced or oxidized.

TABLE 5-7. DETAILED EVALUATION FOR GROUNDWATER
GW-3: MNA WITH IN-SITU TREATMENT

EVALUATION CRITERIA	DETAILED ANALYSIS
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	Appropriate in-situ treatment processes (to be determined during pre-remedial studies) would be utilized to reduce the toxicity of many of the organic contaminants. In some cases, by-products of degradation processes would be more toxic than the parent contaminants. However, these by-products would also degrade to less-toxic analytes. Mobility of some analytes (e.g., manganese) would also be reduced as the aquifer's oxidation state increases.
Degree to which Treatment is Irreversible	The in-situ treatment processes utilized in this alternative are irreversible.
Type and Quantity of Residuals Remaining after Treatment	Residual by-products of in-situ-treated contaminants may remain in the aquifer. Depending on the in-situ process(es) selected, there may also be treatment residuals (e.g., permeable reactive barrier spent media).
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Short-term community risks associated with installation/operation of in-situ technologies and environmental monitoring would be minor. Spill prevention of oxidants may need to be implemented if in-situ oxidation is utilized.
Protection of Workers During Remedial Actions	Short-term worker risks associated with well installation, in-situ technology installation/operation, and environmental monitoring would be mitigated through the use of proper PPE.
Environmental Impacts	Short-term, minor impacts to ecological habitat due to monitoring well installation, in-situ technology installation, and environmental monitoring would occur. If oxidants are utilized, caution must be taken to prevent migration of oxidants to downgradient areas which could be adversely impacted.
Time to Achieve Remedial Action Objectives	RAOs associated with groundwater ingestion and migration beyond the groundwater management zone would be assumed to be achieved upon implementation of ICs (likely less than one year). Monitoring of discharge to the Rockwood Brook Wetland Study Area would need to be performed to determine if the final groundwater RAO (regarding contamination of other areas of concern) is attained. However, the in-situ treatment processes would be designed to improve the time for which this RAO is achieved (assume less than one year for implementation).
IMPLEMENTABILITY	
Ability to Construct and Operate	MNA is easy to implement. Other in-situ processes have limitations on installation and applicability. However, the alternative is flexible enough to allow for various configurations.
Reliability of the Technology	The combination of in-situ processes, including MNA, creates a reliable remedy.

TABLE 5-7. DETAILED EVALUATION FOR GROUNDWATER GW-3: MNA WITH IN-SITU TREATMENT

EVALUATION CRITERIA	DETAILED ANALYSIS
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	Multiple monitoring locations would be sampled to evaluate the effectiveness of the remedy.
Ability to Obtain Approvals and Coordinate with Other Agencies	ICs would require coordination with other agencies.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Off-Site disposal services may be needed for spent permeable reactive barrier spent media and monitoring wastes. These services are readily available.
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the equipment and services required by this alternative.
Availability of Technology	There are multiple vendors for each of the potential technologies.
COSTS	
Capital Cost	$433,486
Net Present Worth of O&M Costs	$2,469,713
Net Present Worth of Periodic Costs	$38,754
Total Net Present Worth Cost	$2,941,953

TABLE 5-8. DETAILED EVALUATION FOR GROUNDWATER
GW-4: PUMP AND TREAT

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would eliminate potential human ingestion exposure to groundwater as a potable water supply so long as ICs are enforced, until groundwater cleanup standards are achieved. Short-term human health risks associated with collection/treatment system installation/operation and environmental monitoring would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	There were no unacceptable ecological risks determined in the baseline ecological risk assessment (BERA). Short-term, minor impacts to ecological habitat due to collection/treatment system installation would occur. Potential changes to Site hydrology may impact the Rockwood Brook Wetland Study Area.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical-, location-, and action-specific ARARs would be complied with. Refer to Table D-7 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	As source control actions have recently been completed, an estimate of the residual risk at the beginning of the remedial action is difficult. However, dissolved-phase contaminants above PRGs are expected to exist during the time period when this alternative would be functioning. ICs would be implemented as further protection against accessing the groundwater as a potable water supply and would be maintained until all groundwater cleanup standards are achieved.
Adequacy and Reliability of Controls	Extraction wells are reliable for limiting migration and collecting contaminated groundwater. ICs are reliable if properly enforced.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	For costing purposes, assumed treatment processes include an oil/water separator, precipitation, and UV/chemical oxidation. The pre-remedial study will determine if other processes are more appropriate.
Amount Destroyed or Treated	This alternative would treat most of the groundwater contaminants. The estimated collection system flow rate would be 20 gpm.

TABLE 5-8. DETAILED EVALUATION FOR GROUNDWATER
GW-4: PUMP AND TREAT

EVALUATION CRITERIA	DETAILED ANALYSIS
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	Following collection, residual LNAPL would be separated from the contaminated groundwater. The LNAPL would be shipped off-Site for treatment and/or disposal. Therefore, the treatment system would not reduce the toxicity or volume of the LNAPL. Dissolved-phase contaminants in the groundwater would be treated by technologies which, in some cases, fully destroy the contaminants (some organics via UV/chemical oxidation). Metals would be primarily removed through precipitation methods, so toxicity of the dissolved-phase metals is reduced.
Degree to which Treatment is Irreversible	With respect to the treatment processes, the system is irreversible. In looking at the extraction/treatment remedy as a whole, a shut down of the system would not create a situation where the Site returns to original conditions. Whatever would be removed and treated would irreversibly reduce contaminant contribution to risk.
Type and Quantity of Residuals Remaining after Treatment	As source control actions have recently been completed, estimates of residuals cannot be made until pre-remedial studies are performed. Treatment residuals potentially include the collected LNAPL and metals sludges.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Short-term community risks associated with remedy construction, operation, and environmental monitoring would be minor. These impacts would be mitigated as necessary.
Protection of Workers During Remedial Actions	Short-term worker risks associated with remedy construction, operation, and environmental monitoring would be mitigated through the use of proper PPE.
Environmental Impacts	Short-term, minor impacts to ecological habitat due to collection/treatment system installation would occur. Potential changes to Site hydrology may impact the Rockwood Brook Wetland Study Area since treated groundwater will either be reinjected into the ground or discharged to surface waters.
Time to Achieve Remedial Action Objectives	RAOs for groundwater would be achieved upon implementation of ICs and completion of collection/treatment system construction (likely less than one year).
IMPLEMENTABILITY	
Ability to Construct and Operate	Extraction and treatment systems are common and easy to implement/operate.
Reliability of the Technology	The technologies utilized are known to be reliable.

TABLE 5-8. DETAILED EVALUATION FOR GROUNDWATER
GW-4: PUMP AND TREAT

EVALUATION CRITERIA	DETAILED ANALYSIS
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur, however, there would be demobilization issues if the pump and treat system was replaced with another remedial alternative.
Ability to Monitor Effectiveness	Multiple monitoring locations would be sampled to evaluate the effectiveness of the remedy.
Ability to Obtain Approvals and Coordinate with Other Agencies	Approvals for final treated groundwater discharge either back to groundwater or to surface waters would require coordination with other agencies. ICs would also require coordination with other agencies.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Multiple facilities would be able to accept the treatment residuals for final disposition.
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the equipment and services required by this alternative.
Availability of Technology	This alternative contains commonly-used technologies.
COSTS	
Capital Cost	$1,776,479
Net Present Worth of O&M Costs	$4,811,964
Net Present Worth of Periodic Costs	$52,477
Total Net Present Worth Cost	$6,640,920

TABLE 5-9. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would not provide protection of human health from potential risks due to exposure to backfilled soils under the existing permeable soil cap in the former drum disposal area (FDDA). There would be no additional short-term human health risks associated with this alternative.
Ecological Protection	This alternative would not provide protection of ecological receptors from potential risks due to exposure to backfilled soils under the existing permeable soil cap in the FDDA. There would be no additional short-term ecological risks associated with this alternative.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	Chemical-specific To Be Considered standards, Cancer Slope Factors and EPA Risk Reference Doses, could be used to calculate the human health risks potentially posed by the backfilled soil within the Former Drum Disposal Area. If risks were determined, the No Action alternative would not address them. In the future, to support potential NPL site deletion, additional sampling and the above standards could be used to calculate human health risks and the appropriateness of site deletion. Refer to Table D-8 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	Since this alternative includes no controls to reduce potential exposures to contaminated soils, any potential residual risk would not be changed.
Adequacy and Reliability of Controls	This alternative does not include any controls to reduce potential future exposures to contaminated soils.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.

TABLE 5-9. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to the community from the remedy.
Protection of Workers During Remedial Actions	Since this alternative involves no construction or monitoring measures, there would be no additional short-term risks to workers from the remedy.
Environmental Impacts	Since this alternative involves no construction or monitoring measures, there would be no adverse, short-term environmental impacts associated with the remedy.
Time to Achieve Remedial Action Objectives	This alternative would not achieve RAOs.
IMPLEMENTABILITY	
Ability to Construct and Operate	No construction or operation would be performed under this alternative.
Reliability of the Technology	No technologies would be implemented under this alternative.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur.
Ability to Monitor Effectiveness	No monitoring would be conducted under this alternative. Therefore, the effectiveness would not be evaluated.
Ability to Obtain Approvals and Coordinate with Other Agencies	No approvals would likely be needed for this alternative.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative.
Availability of Necessary Equipment and Specialists	No equipment or specialists would be needed under this alternative.
Availability of Technology	No technologies would be needed for this alternative.

TABLE 5-9. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-1: NO ACTION

EVALUATION CRITERIA	DETAILED ANALYSIS
COSTS	
Capital Cost	--
Net Present Worth of O&M Costs	--
Net Present Worth of Periodic Costs	$12,400
Total Net Present Worth Cost	$12,400

TABLE 5-10. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-2: MAINTAIN PERMEABLE SOIL CAP

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would provide protection of human health from potential risks due to exposure to backfilled soils under the existing permeable soil cap in the former drum disposal area (FDDA) so long as ICs are enforced. Short-term human health risks associated with capping soils in the FDDA would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	This alternative would provide protection of ecological receptors from potential risks due to exposure to backfilled soils under the existing permeable soil cap in the FDDA so long as ICs are enforced.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical- and action-specific ARARs would be complied with. Refer to Table D-9 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	As contaminated soils would remain in place, any potential residual risk would not be changed. Institutional controls (ICs) would be implemented to restrict land use, thereby limiting the potential for soil exposures.
Adequacy and Reliability of Controls	Capping is a well-established, reliable technology. ICs are reliable if properly enforced.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.

TABLE 5-10. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-2: MAINTAIN PERMEABLE SOIL CAP

SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	The permeable soil cap has already been constructed. Little to no impacts would be expected from cap maintenance or monitoring activity.
Protection of Workers During Remedial Actions	Short-term worker risks associated with cap maintenance or monitoring would be mitigated as necessary through the use of proper PPE, air monitoring, and dust control.
Environmental Impacts	Short-term impacts to ecological habitat due to cap maintenance or monitoring could occur, but would be mitigated as necessary.
Time to Achieve Remedial Action Objectives	Under this alternative, RAOs would be achieved upon implementation of institutional controls (likely less than one year, depending on approvals necessary).
IMPLEMENTABILITY	
Ability to Construct and Operate	Capping is a simple technology to maintain.
Reliability of the Technology	Capping is reliable. ICs are reliable if properly enforced.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur. However, if an excavation remedy is selected, the existing permeable soil cap would need to be removed.
Ability to Monitor Effectiveness	Environmental monitoring conducted as part of the other components of the remedy will also be used to qualitatively evaluate the effectiveness of the cap. Once groundwater PRGs are obtained, an evaluation may be conducted to determine whether the backfilled soil under the cap may pose a risk to human health. If risks are present, continued groundwater monitoring may still be needed to comply with State landfill closure monitoring requirements. Maintenance of the permeable soil cap would provide continued effectiveness.
Ability to Obtain Approvals and Coordinate with Other Agencies	Approvals for this alternative would likely be minimal
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative, except potentially for some monitoring waste as necessary.
Availability of Necessary Equipment and Specialists	There are many contractors available to provide the equipment and services for maintenance and monitoring.
Availability of Technology	Contractors are readily available.

TABLE 5-10. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-2: MAINTAIN PERMEABLE SOIL CAP

COSTS	
Capital Cost	$10,800
Net Present Worth of O&M Costs	$47,120
Net Present Worth of Periodic Costs	$12,400
Total Net Present Worth Cost	$70,320

TABLE 5-11. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-3: LOW-PERMEABILITY CAP

EVALUATION CRITERIA	DETAILED ANALYSIS
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	This alternative would provide protection of human health from potential risks due to exposure to backfilled soils in the former drum disposal area (FDDA) so long as ICs are enforced. Short-term human health risks associated with capping soils in the FDDA would be mitigated through the use of proper personal protection equipment (PPE).
Ecological Protection	This alternative would provide protection of ecological receptors from potential risks due to exposure to backfilled soils in the FDDA so long as ICs are enforced. Short-term impacts to ecological habitat due to cap installation would occur.
COMPLIANCE WITH ARARS	
Chemical-, Location-, and Action-Specific	All chemical- and action-specific ARARs would complied with. Refer to Table D-10 in Appendix D of the FS for a list of ARARs associated with this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	As contaminated soils would remain in place, any potential residual risk would not be changed. Institutional controls (ICs) would be implemented to restrict land use, thereby limiting the potential for soil exposures.
Adequacy and Reliability of Controls	Capping is a well-established, reliable technology. ICs are reliable if properly enforced. A low-permeability cap may reduce the effectiveness of the MNA groundwater remedies.
REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	No treatment would be performed under this alternative.
Amount Destroyed or Treated	No treatment would be performed under this alternative.
Degree of Expected Reductions of Toxicity, Mobility, or Volume through Treatment	No treatment would be performed under this alternative.
Degree to which Treatment is Irreversible	No treatment would be performed under this alternative.

TABLE 5-11. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-3: LOW-PERMEABILITY CAP

EVALUATION CRITERIA	DETAILED ANALYSIS
Type and Quantity of Residuals Remaining after Treatment	No treatment would be performed under this alternative.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Actions	Short-term community risks associated with cap construction and maintenance may include impacts from dust and truck traffic. These impacts would be mitigated as necessary through use of air monitoring, dust control, and a transportation plan.
Protection of Workers During Remedial Actions	Short-term worker risks associated with cap construction, maintenance, and monitoring would be mitigated as necessary through the use of proper PPE, air monitoring, and dust control.
Environmental Impacts	Short-term impacts to ecological habitat due to cap installation, maintenance, and monitoring would occur, but would be mitigated as necessary.
Time to Achieve Remedial Action Objectives	Under this alternative, RAOs would be achieved upon completion of cap construction and implementation of institutional controls (likely less than one year, depending on approvals necessary).
IMPLEMENTABILITY	
Ability to Construct and Operate	Capping is a simple technology to construct and maintain.
Reliability of the Technology	Capping is reliable. ICs are reliable if properly enforced.
Ease of Undertaking Additional Remedial Actions, If needed	If further action is deemed necessary in the future, this alternative would allow for additional remedial actions to occur. However, if an excavation remedy is selected, capping materials would need to be removed.
Ability to Monitor Effectiveness	Environmental monitoring conducted as part of the other components of the remedy will also be used to qualitatively evaluate the effectiveness of the cap. Once groundwater PRGs are obtained, an evaluation may be conducted to determine whether the backfilled soil under the cap may pose a risk to human health. If risks are present, continued groundwater monitoring may still be needed to comply with State landfill closure monitoring requirements. Maintenance of the cap would provide continued effectiveness.
Ability to Obtain Approvals and Coordinate with Other Agencies	Approvals for this alternative would likely be minimal
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	No off-Site treatment, storage, or disposal services would be needed under this alternative, except potentially for monitoring waste.

TABLE 5-11. DETAILED EVALUATION FOR THE FORMER DRUM DISPOSAL AREA SOILS FDDA-3: LOW-PERMEABILITY CAP

EVALUATION CRITERIA	DETAILED ANALYSIS
Availability of Necessary Equipment and Specialists	Capping construction and maintenance is a common technology. There are many contractors available to provide the equipment and services.
Availability of Technology	Contractors are readily available.
COSTS	
Capital Cost	$1,053,353
Net Present Worth of O&M Costs	$50,840
Net Present Worth of Periodic Costs	$12,400
Total Net Present Worth Cost	$1,116,593

APPENDICES

Appendix A: New Hampshire Department of Environmental Services

Appendix B: Glossary of Terms and Acronyms

Appendix C: ARARs Tables

Appendix D: Administrative Record Index

Appendix E: Groundwater Use and Value Determination

APPENDIX A

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
LETTER OF CONCURRENCE

The State of New Hampshire
Department of Environmental Services

Michael P. Nolin
Commissioner

September 23, 2005

Susan Studlien, Director
Office of Site Remediation and Restoration
EPA - New England, Region I
1 Congress Street, Suite 1100
Boston, MA 02114-2023

RE: RECORD OF DECISION - Troy Mills Landfill Superfund Site (DES Site # 198405082)

SUBJECT: DECLARATION OF CONCURRENCE

Dear Ms. Studlien:

The New Hampshire Department of Environmental Services (Department) has reviewed the Record of Decision (ROD) dated September 2005 for the Troy Mills Landfill Superfund Site (Site) in Troy, New Hampshire. The United States Environmental Protection Agency (EPA) prepared the ROD in accordance with the provisions of the Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986. The ROD addresses the remedial actions necessary under CERCLA, as amended, to manage potential threats to human health and the environment at the Site.

Findings of the Remedial Investigation and Feasibility Study

In 2004 and 2005 EPA conducted a Remedial Investigation/Feasibility Study (RI/FS) to characterize Site conditions, assess the related risks to human health and the environment and evaluate cleanup alternatives.

The RI documented the presence of a Light Non-aqueous Phase Liquid (LNAPL) and LNAPL-contaminated leachate at the Site. The RI also identified a plume of groundwater contamination, approximately 8-9 acres in size, which includes the area beneath the former two-acre drum disposal area. Organic contaminants such as alkylbenzenes, chlorinated solvents, phthalates and toluene were determined to exceed applicable groundwater standards and are the primary contaminants of concern in groundwater.

The RI risk assessment found that contaminant concentrations do not pose a significant risk to human health and the environment under current use scenarios in the adjacent leachate-impacted wetland area,. In addition, no significant current or future ecological risks were identified at the Site. However, for the future young child and adult recreational user, the carcinogenic and non-carcinogenic risks exceeded the acceptable risk levels primarily due to the presence of bis(2-ethylhexyl)phthalate in leachate and manganese in wetland soils.

Furthermore, the human health risks associated with the potential consumption of contaminated groundwater were determined to be greater than the State's Cumulative Cancer Risk Limit (i.e., one-in-one hundred thousand or 10^{-5}), as well as EPA's acceptable risk range (i.e., 10^{-4} to 10^{-6}) and the State's and EPA's Cumulative Non-cancer Risk Limit, which is a Hazard Index (HI) equal to one.

During the RI, the Department used EPA's guidance document entitled, "Ground Water Use and Value Determination Guidance, Final Draft," to determine that groundwater in the Site vicinity is "Medium Use and Value." The New Hampshire Groundwater Protection Act requires ambient groundwater quality to meet drinking water standards in order to protect all groundwater as a drinking water supply. The Department recognizes the fundamental importance of the groundwater resource and requires the natural quality of the groundwater resource to be preserved and protected in order that groundwater can be used as a drinking water supply.

In the FS, multiple source control and management of migration alternatives were evaluated. LNAPL source control alternatives ranged from no action to maintaining the existing LNAPL interceptor trenches to active extraction and treatment of LNAPL. Former drum disposal area soil source control alternatives ranged from no action to maintaining the permeable soil cap to construction an impermeable soil cap. Groundwater management of migration alternatives ranged from no action to monitored natural attenuation to utilizing in-situ treatment technologies to constructing and operating a groundwater extraction, treatment, and discharge system.

During the remedy selection process, the Department assisted EPA in presenting the findings of the RI/FS and the Proposed Plan to the public at two meetings held in the Town of Fitzwilliam. At these meetings, and the thirty-day public comment period, questions and comments were taken for consideration while selecting an appropriate remedy for the Site.

Overview of the Record of Decision

The ROD sets forth the selected remedy for the Site; which is a combination of the source control and management of migration alternatives. The remedy will adequately protect human health and the environment by:

- Capturing all potential free product, LNAPL, in a series of existing LNAPL interceptor trenches, with off-site disposal;

- Maintaining a two-foot thick permeable soil cap to prevent potential contact with residual contaminated soil in the former drum disposal area. The permeable soil cap allows precipitation to infiltrate through the cap and facilitate the cleanup of groundwater;

- Restoring groundwater to drinking water standards through monitored natural attenuation;

- Establishing institutional controls that restrict the use of contaminated groundwater for drinking water purposes until groundwater cleanup levels have been achieved; restrict activities that would disturb the permeable cap, prevent the disturbance of remedy components until they are no longer needed, and require notification of any changes in the use of the land; and

- Implementing a comprehensive monitoring and sampling program to evaluate groundwater, surface water, leachate, sediment, and wetlands to ensure that natural attenuation processes are continuing as expected;

The total estimated present worth cost of the remedy is approximately $3,000,000.

Justification for the Selected Remedy

The selected remedy protects human health and the environment, complies with all ARARs and will allow for future recreational use of the Site. The selected remedy is a comprehensive one that utilizes source control and management of migration components to address the principal Site risks.

Between July 2004 and the summer of 2005, EPA excavated and removed 7,692 55-gallon drums, 29,924 gallons of flammable liquid waste, 26,244 tons of heavily contaminated soil and 3,099 cubic yards of waste sludge as part of a time-critical removal action. Removal and off-site disposal of the drums, their contents, and heavily contaminated soils represents a significant source control accomplishment and is incorporated into this selected remedy.

Additional source control measures are required to address potential human health risks posed by LNAPL and residual low-level contaminated soils remaining in the former drum disposal area. Maintenance of the permeable soil cap will prevent potential direct exposure risks to underlying soils and facilitate the monitored natural attenuation remedy for contaminated groundwater. Continued maintenance of the LNAPL interceptor trenches will effectively capture and remove LNAPL and is expected to achieve remedial action objectives within five years.

With the removal of the primary source of contamination at the Site, the selected remedy will allow naturally occurring processes to continue reducing contaminant concentrations in groundwater. Monitoring of groundwater, surface water, sediment, and wetlands will continue to measure remedy effectiveness in reducing contaminant concentrations in all impacted media.

State Concurrence

In reviewing the ROD, the Department has determined that the selected remedy is consistent with the Department's requirements for a remedial action plan and meets all of the criteria for remedial action plan approval. The selected remedy establishes a remedial action that will remove, treat or contain the contamination source to prevent the additional release of contaminants to groundwater, surface water and soil and eliminates the health hazard associated with direct exposure to the contaminant source. The selected remedy will also contain contaminated groundwater within the limits of a Groundwater Management Zone and restore groundwater quality to meet the State's Ambient Groundwater Quality Standards. Ultimately, the proposed remedial action will provide protection of human health and the environment. Therefore, the Department, acting on behalf of the State of New Hampshire, concurs with the selected remedy as described in the ROD.

In striving to maximize the effectiveness of limited public and private resources, the Department continues to seek reasonable and practical solutions to the complex challenges associated with contaminated site cleanups. The partnership and dedication of EPA and the Department will speed up the achievement of our mutual environmental goals at this Site. As always, the Department stands ready to provide the guidance and assistance that EPA may require to take the actions necessary to protect human health and the environment completely and cost-effectively.

Sincerely,

Frederick J. McGarry

FOR Anthony P. Giunta, P.G., Director
Waste Management Division

cc: Frederick J. McGarry, P.E., DEE, NHDES
Carl W. Baxter, P.E., NHDES
Richard Pease, P.E., NHDES
John Splendore, P.E., NHDES
Jennifer Patterson, Esq., NHDOJ
James Chow, USEPA
Glen Shattler, Chairman, Troy Selectmen
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APPENDIX B

GLOSSARY OF TERMS AND ACRONYMS

GLOSSARY OF TERMS AND ACRONYMS

AGQS	New Hampshire Ambient Groundwater Quality Standards
ARAR	Applicable or Relevant and Appropriate Requirements
AWQC	Ambient Water Quality Criteria
BEHP	Bis(2-ethylhexyl)phthalate
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, And Xylene
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, And Liability Act
CFR	Code of Federal Regulations
COC	Chemicals of Concern
COD	Chemical Oxygen Demand
CWA	Clean Water Act
DCA	Dichloroethane
DCE	Dichloroethene
DNAPL	Dense Non-aqueous Phase Liquids
EPA	US Environmental Protection Agency – Region I
FS	Feasibility Study
LNAPL	Light Non-aqueous Phase Liquids
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M&E	Metcalf & Eddy
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHDES	New Hampshire Department of Environmental Services
NOAA	National Oceanic and Atmospheric Administration
NPW	Net Present Worth
PAH	Polynuclear Aromatic Hydrocarbons
PCE	Perchloroethylene (i.e., tetrachloroethene)
PRB	Permeable Reactive Barrier
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SVOC	Semi-volatile Organic Compound
TBC	To be considered
TCA	Trichloroethane
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
VOC	Volatile Organic Compound

APPENDIX C

ARARS TABLES

TABLE C-1 - CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirement	Status	Requirement Synopsis	Consideration in the RI/FS
Federal Requirements	Safe Drinking Water Act (42 U.S.C... §300f *et seq.*); National primary drinking water regulations (40 C.F.R.. 141)	Relevant and Appropriate	Establishes maximum contaminant levels (MCLs) for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate cleanup standards for aquifers and surface water bodies that are potential drinking water sources.	Groundwater in and around the property boundary is considered a potential drinking water source. Analytes detected at the Site at levels above MCLs are presented (along with the MCLs) in Table 8 of Appendix A of the FS. Monitored Natural Attenuation will monitored until groundwater achieves these standards.
	Safe Drinking Water Act (42 U.S.C... §300f *et seq.*); National primary drinking water regulations (40 C.F.R.. 141)	Relevant and Appropriate for non-zero MCLGs only; MCLGs set as zero are To Be Considered.	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds.	Groundwater in and around the property boundary is considered a potential drinking water source. Non-zero MCLGs are relevant and appropriate. MCLGs set at zero are to be considered. Monitored Natural Attenuation will achieve these standards over time.
Federal Criteria, Advisories, and Guidance	EPA Risk Reference Dose (RfDs)	To Be Considered	RfDs are considered to be the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Hazards due to noncarcinogens with EPA RfDs were used to develop target cleanup levels. Monitored Natural Attenuation will achieve these standards over time for groundwater. For the cap, they will be used to assess remaining risks from residual soils under the permeable soil cap.
	EPA Carcinogenicity Slope Factor	To Be Considered	Slope factors are developed by EPA from Health Effects Assessments and present the most up-to-date information on cancer risk potency. Slope factors are developed by EPA from Health Effects Assessments by the Carcinogenic Assessment Group.	Risks due to carcinogens as assessed with slope factors were used to develop target cleanup levels.
	Health Advisories (EPA Office of Drinking Water)	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for contaminants in groundwater that may be used for drinking water	Health advisories will be used to evaluate the non-carcinogenic risk resulting from exposure to certain compounds (e.g., manganese).
State Requirements	Drinking Water Quality Standards: NH Admin. Code Env-Ws 316 MCLs and MCLGs for Inorganics; NH Admin. Code Env-Ws 317 MCLs and MCLGs for Regulated Organics; Regulated Secondary MCLs NH Admin. Code Env – Ws 319.	Relevant and Appropriate for MCLs and non-zero MCLGs only; MCLGs set as zero are To Be Considered.	State MCLs and MCLGs establish maximum contaminant levels permitted in public water supplies and are the basis of State AGQSs that are applicable to Site groundwater. Secondary Maximum Contaminant Levels (MCLs) apply to contaminants that primarily affect the aesthetic quality of drinking water. The regulations are generally equivalent to the Federal SDWA.	Groundwater in and around the property boundary is considered a potential drinking water source. Monitored Natural Attenuation will achieve these standards over time.

TABLE C-2 - LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirements	Status	Requirement Synopsis	Applicability To Site Conditions
Federal Requirements	Fish and Wildlife Coordination Act (16 U.S.C.. §661 *et seq.*); Fish and wildlife protection (40 C.F.R. §6.302(g))	Applicable	Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Services and the appropriate state wildlife agency to develop measures to prevent, mitigate, or compensate for losses of fish and wildlife.	The Site includes streams, wetlands, and downstream waterbodies. Although operation, maintenance and closure of the monitoring wells and other components of the remedy is not anticipated to impact these resource areas directly, planning and decision-making will incorporate fish and wildlife protection considerations in consultation with the resource agencies.
	Executive Order 11990; "Protection of Wetlands" (40 C.F.R. Part 6, Appendix A)	Applicable	Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. Action to avoid, whenever possible, the long- and short-term impacts on wetlands and to preserve and enhance wetlands.	All practicable means will be used to minimize harm to the wetlands. Wetlands disturbed by well installation, maintenance, monitoring or other remedial activities will be mitigated in accordance with requirements. The public will be kept informed of activities involving wetlands, as required.
	Clean Water Act, Section 404 (33 U.S.C.. § 1344); (40 C.F.R. Part 230 and 33 C.F.R. Parts 320-323)	Applicable	Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Well installation, maintenance, monitoring or other remedial actions that include dredging or filling in wetlands will be implemented to meet these requirements.
	Executive Order 11988; "Floodplain Management" (40 C.F.R. Part 6, Appendix A)	Applicable	Action to avoid, whenever possible, the long- and short-term impacts associated with the occupancy and modifications of floodplains development, wherever there is a practical alternative. Promotes the preservation and restoration of floodplains so that their natural and beneficial value can be realized.	The Site includes areas defined to be within the 100-year floodplain. Remedial actions that involve construction in the floodplain areas will include all practicable means to minimize harm to and preserve beneficial values of floodplains. Floodplains disturbed by remedial actions will be restored to their original conditions and utility.
State Requirements	Criteria and Conditions for Fill and Dredge In Wetlands: RSA Ch. 482-A and NH Admin. Code Env-Wt Parts 300-400, 600, and 700	Applicable	These standards regulate filling and other activities in or adjacent to wetlands, and establish criteria for the protection of wetlands from adverse impacts on fish, wildlife, commerce, and public recreation.	Remedial activities in wetlands located in or adjacent to the Site must comply with these wetlands protection requirements.

TABLE C-3 - ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirement	Status	Requirement Synopsis	Consideration in the RI/FS
Federal Requirements	Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 *et seq.*, Standards for identification and listing of hazardous waste, 40 C.F.R. Part 261	Applicable	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations. These provisions have been adopted by the State.	Any wastes generated by remedial activity will be analyzed by appropriate test methods. If found to be hazardous wastes, then they will be managed in accordance with the substantive requirements of the State hazardous waste regulations.
	RCRA, Standards applicable to generators of hazardous wastes, 40 C.F.R. Part 262	Applicable	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations. These provisions have been adopted by the State.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of the State hazardous waste regulations.
	RCRA, Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities, 40 C.F.R. Part 264	Applicable	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations. The relevant and appropriate provisions of 40 C.F. R. Part 264 are incorporated by reference.	If a component of the remedy generates hazardous waste it will be operated, maintained and eventually closed in compliance with the substantive requirements of the State hazardous waste regulations.
	RCRA, Air Emissions from Process Vents, 40 C.F.R.. Part 264, Subpart AA	Applicable	Establishes air emission controls for process vents, closed-vent systems, and control devices at hazardous waste facilities; and apply to distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that "manage hazardous wastes with organic concentrations of a least 10 ppmv." New Hampshire has not yet adopted these regulations so these federal regulations are the applicable standard.	If a component of the remedy generates hazardous waste and utilizes a process regulated by this section, air emission controls will be implemented if the applicability threshold is met.
	RCRA, Air Emission Standards for Equipment Leaks, 40 C.F.R. Part 264, Subpart BB	Applicable	Establishes air emission standards for equipment leaks at hazardous waste facilities where equipment "contains or contacts hazardous wastes with organic concentrations of at least 10 per cent by weight." New Hampshire has not yet adopted these regulations so these federal regulations are the applicable standard.	If equipment used for the collection of LNAPL or other remedial action covered by this standard handles hazardous substances at concentrations that meet this regulation's threshold, then air emission controls will be implemented.
	Clean Air Act (CAA), National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 42 U.S.C. § 112(b)(1), 40 C.F.R. Part 61	Applicable	The regulations establish emissions standards for 189 hazardous air pollutants. Standards set for air strippers, dust control and other release sources.	Active removal of LNAPL by vacuum truck, or other process, or any other remedial activities on the Site which generates air emissions or which may release any of the listed air pollutants, will meet these standards.
	CWA, Ambient Water Quality Criteria (AWQC), 40 C.F.R.. 122.44	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and aquatic life.	Used to establish monitoring standards for surface waters and sediments.
Federal Criteria, Advisories, and Guidance	Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. OSWER Directive 9200.4-17P, April 21, 1999	To Be Considered	This guidance sets criteria for evaluating monitored natural attenuation as a remedy at, among others, Superfund sites.	Criteria for assessing the natural attenuation remedy for groundwater will be utilized.

TABLE C-3 - ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirement	Status	Requirement Synopsis	Consideration in the RI/FS
	EPA Guidance: Risk-based Clean Closure, March 16, 1998	To Be Considered	This guidance describes risk-based clean closure at RCRA hazardous waste units.	Clean closure standards for the backfilled soil at the former drum disposal area will be assessed utilizing this guidance.
	EPA Presumptive Remedy for CERCLA Municipal Landfill Sites Guidance. EPA540-F-93-035, Sept. 1993	To Be Considered	Guidance on developing a presumptive remedy for hazardous and solid waste landfills.	Guidance used to develop presumptive capping remedy for the former drum disposal area.
State Requirements	Groundwater Protection Standards: NH Admin. Code Env-Wm 1403	Applicable	Establishes protective standards for water discharges to groundwater. Wm 1403.03(a) and (b) provide that groundwater shall be suitable for use as drinking water without treatment and shall not contain any regulated contaminant in concentrations greater than ambient groundwater quality standards (AGQS) established in Env-Wm 1403.05. Wm 1403.03 (c) provides that, unless naturally occurring, groundwater shall not contain any contaminants at concentrations such that groundwater to surface water results in a violation of surface water standards in any surface water body within or adjacent to the Site unless the groundwater discharge is exempted under Env-Wm 1403.04. Establishes groundwater management zones (GMZ).	Groundwater monitoring will use these standards to assess the success of natural attenuation in attaining State AGQSs. A GMZ will be established at the Site and will remain in place until cleanup goals have been attained throughout the GMZ. Groundwater use within a groundwater management zone will be restricted by institutional controls.
	RSA Ch. 149-M, New Hampshire Solid Waste Management Act; NH Admin. Code Env-Wm 100-300, 2100-3700 *et seq.*	Relevant and Appropriate	These provisions establish standards applicable to the treatment, storage and disposal of solid waste and the closure of solid waste facilities.	The specific portions of the State regulations that are relevant and appropriate to the remedial measures at the former drum disposal area are closure and post-closure requirements for monitoring and institutional controls. Requirements calling for landfill impermeable cover requirements are not relevant and appropriate since the alternative's permeable cover is a component of the natural attenuation remedy for groundwater at the Site.
	NH Admin. Code Env-Wm 1600 Reporting and Remediation of Oil Discharges	Relevant and Appropriate	The discharge or spillage of NAPL or oil into the public surface waters and groundwaters of the state is prohibited. Env-Wm 1600 establish procedures and requirements for notification, reporting, investigations and response actions for oil and NAPL discharges.	LNAPL removal as part of the remedy will be in compliance with the substantive provisions of these standards.
	N.H.. Admin. Code Env-Wm 403.6 - Identification and Listing of Hazardous Wastes; Toxicity Characteristic	Applicable	These requirements list particular hazardous waste and identify the maximum concentration of contaminants for which the waste would be a RCRA characteristic waste. The analytical test set out in Appendix II of 40 C.F.R.. Part 261 is referred to as the Toxicity Characteristic Leaching Procedure (TCLP).	Any wastes generated by remedial activity will be analyzed to determine whether they are listed or characteristic hazardous waste under RCRA. Materials that are listed waste or exceed TCLP hazardous waste thresholds will be disposed off-Site in a RCRA Subtitle C facility. Non-hazardous materials will be disposed appropriately.

TABLE C-3 - ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirement	Status	Requirement Synopsis	Consideration in the RI/FS
	N.H.. Admin. Code Env-Wm 500 [formerly He-P Ch. 1905.06] - Requirements for Hazardous Waste Generators	Applicable	Requires determination as to whether waste materials are hazardous and, if so, requirements for managing such materials on-Site prior to shipment off-Site.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of these regulations prior to off-Site shipment.
	N.H.. Admin. Code Env-Wm 700 [formerly He-P Ch. 1905.08] - Requirements for Owners and Operators of Hazardous Waste Facilities	Applicable	This regulation establishes requirements for owners or operators of hazardous waste sites (federal requirements 40 C.F.R.. are incorporated by reference.	If a component of the remedy generates hazardous waste it will be operated, maintained and eventually closed in compliance with these standards.
	N.H. Admin. Code Env-Wm 708.03(d)(8) [formerly He-P Ch. 1905.08(f)(1)(d)] - Miscellaneous Units	Applicable	General design and operation requirements for miscellaneous units for addressing hazardous wastes.	If the interceptor trench generates hazardous waste it will be operated, maintained and eventually closed in compliance with these standards.
	RSA Ch. 125-C, Air Pollution Control: NH Admin. Code ENV-A 100 – 3800 Rules Governing the Control of Air Pollution	Applicable	These provisions establish standards for the release of air emissions, including VOCs and hazardous air pollutants. Applicable standards include the most stringent of the following requirements: (1) New Source Performance Standards, (40 C.F.R. Part 60); (2) National Emissions Standards for Hazardous Air Pollutants (40 C.F.R. Part 61); and (3) New Hampshire State Implementation Plan limits. See RSA 125-C:6.	If there are remedial process that result in releases of contaminants into the air, air quality standards will be complied with during remedial activities.
	NH Admin. Code Env-A 300, Ambient Air Quality Standards	Applicable	These regulations set primary and secondary ambient air quality standards (equivalent to federal standards). The standards do not allow significant deterioration of existing air quality in any portion of the state for: particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone hydrocarbons and lead.	If there are remedial process that result in releases of contaminants into the air, air quality standards will be complied with during remedial activities.
	NH Admin. Code Env-A Part 1400, Regulated Toxic Air Pollutants	Applicable	This regulation identifies toxic air pollutants to be regulated. These pollutants are also listed by EPA in 40 CFR 261. High, moderate and low Toxicity Classifications are established. Air toxics in these classifications are regulated when they occur in concentrations that cause adverse health effects including increased cancer risk.	If there is active removal of LNAPL by vacuum truck or other process, air quality standards will be complied with during remedial activities.
	NH Admin. Code Env-Ws 1700 Surface Water Quality Standards	Applicable	These rules is to establish water quality standards for the state's surface waters. Water quality criteria for toxic substances are established. [See Part Env-Ws 1703 Water Quality Standards and Env-Ws 1704 Alternative Site-specific Criteria]. These rules are applicable to point or non-point discharge(s) of pollutants to surface waters.	Standards to be used to establish monitoring standards for surface waters and sediments. Standards will be used to measure the performance and effectiveness of the remedial action in preventing contaminated groundwater, leachate, and discharges from degrading nearby surface waters.
	NH Admin. Code Env-Wm 1403.27 Groundwater Monitoring Wells	Relevant and Appropriate	These standards establish requirements and criteria for constructing, developing, and decommissioning monitoring wells.	The construction, development, and decommissioning of monitoring wells will be conducted in accordance with the requirements of this section.

TABLE C-3 - ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

Authority	Requirement	Status	Requirement Synopsis	Consideration in the RI/FS
	NH Admin. Code Env-We 604 Standards for Construction, Maintenance and Abandonment of Wells	Applicable	This provision requires that wells be constructed, maintained, relocated, and/or abandoned according to these regulations.	All wells used for the remedy will be created, operated, and closed in compliance with these standards.
	N.H.. R.S.A.. 485-A:17 and N.H.. Admin. Code Env-Wm 415 - Terrain Alteration	Applicable - Relevant and Appropriate for Disturbed Areas under 100,000 square feet	Establishes criteria to control erosion and run-off for any activity that significantly alters terrain more than 100,000 contiguous square feet.	Any remedial activities on the Site which disturb the Site will comply with these regulation's substantive erosion control and runoff standards.
	N.H.. Admin. Code Env-A Part 1002 - Fugitive Dust Control	Applicable	Requires precautions to prevent, abate and control fugitive dust during specified activates, including excavation and construction.	Precautions to control fugitive dust emissions will be required both during and after Site remediation, including maintaining the vegetated cover on the permeable soil cap.

APPENDIX D

ADMINISTRATIVE RECORD INDEX

Troy Mills Landfill
NPL Site Administrative Record
Record of Decision (ROD)
Operable Unit 1

Index

September 2005

Prepared by
EPA New England
Office of Site Remediation & Restoration

Introduction to the Collection

This is the Administrative Record for the Troy Mills Landfill Superfund site, Troy, NH, OU 1, Entire Site, Record of Decision (ROD), released September 2005. The file contains site-specific documents and a list of guidance documents used by EPA staff in selecting a response action at the site.

This file replaces the administrative record file for the Record of Decision (ROD) Proposed Plan, released July 2005. This file includes, by reference, the administrative record files for the Troy Mills Landfill Removal Action, September 26, 2002, and Removal Action II, September 1, 2004.

The administrative record file is available for review at:

Gay-Kimball Library
10 South Main Street
Troy, NH 03465
603-242-7743 (phone)
http://town.troy.nh.us/library.html

EPA New England Superfund Records & Information Center
1 Congress Street, Suite 1100 (HSC)
Boston, MA 02114 (by appointment)
617-918-1440 (phone)
617-918-1223 (fax)
http://www.epa.gov/region01/superfund/resource/records.htm

Questions about this administrative record file should be directed to the EPA New England site manager.

An administrative record file is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

Instructions about PDF

Some of the documents in this collection are available as a Portable Document Format (PDF) file. The PDF process maintains the look and presentation of the original document. To view PDF files, you will need Adobe Acrobat Reader software loaded on your computer. This software is available, free of charge, from Adobe Software [this is a link to http://www.adobe.com]. To ensure you will be able to see a PDF file in its entirety, please obtain the most recent version of the free Adobe Reader from the Adobe Web site. (http://www.adobe.com/products/acrobat/readstep.html)

01: SITE ASSESSMENT

234851 **SITE INSPECTION REPORT [WITH TRANSMITTAL]**

Author: MARK L MENGEL NUS/TETRA TECH INC
Addressee: DONALD SMITH US EPA REGION 1
Doc Type: REPORT
Doc Date: 07/24/1985 **# of Pages:** 13
File Break: 01.03

234858 **RESPONSE TO REQUEST FOR INFORMATION ON SENSITIVE SPECIES AND PLANT COMMUNITIES NEAR TROY MILLS LANDFILL**

Author: CORY CRAIG NH DEPT OF NATURAL RESOURCES AND ECONOMIC DEVELOPMENT
Addressee: R EICHHORN ROY F WESTON INC
Doc Type: LETTER
Doc Date: 07/17/1995 **# of Pages:** 18
File Break: 01.18

234852 **FINAL SITE INSPECTION PRIORITIZATION REPORT**

Author: WESTON SOLUTIONS INC
Addressee:
Doc Type: REPORT
Doc Date: 09/25/1996 **# of Pages:** 30
File Break: 01.03

234857 **QUICK TABLES, RACE, HISPANIC OR LATINO, AND AGE: 2000 FOR FITZWILLIAM TOWN, JAFFREY CDP, MARLBOROUGH TOWN, RICHMOND TOWN, SWANZEY TOWN, AND TROY TOWN**

Author: US CENSUS BUREAU
Addressee:
Doc Type: LIST
Doc Date: 01/01/2000 **# of Pages:** 6
File Break: 01.18

01: SITE ASSESSMENT

234859 **DYNCORP REGION 1 SITE VISIT SUMMARY AND PHOTO LOG [WITH TRANSMITTAL DATED 10/24/2001]**

Author: MATTHEW HAYDUK DYNCORP
Addressee: BARBARA STITT DYNCORP
RANDY HIPPEN US EPA - STATE TRIBAL AND SITE ID CENTER
Doc Type: REPORT
Doc Date: 10/03/2001 **# of Pages:** 10
File Break: 01.15

234853 **CALCULATION OF WETLAND FRONTAGE UPSTREAM OF SURFACE WATER / SEDIMENT SAMPLE LOCATIONS WITHIN WETLAND AREA ALONG WHICH PPE IS LOCATED**

Author: STEVEN LENARD WESTON SOLUTIONS INC
Addressee:
Doc Type: REPORT
Doc Date: 05/09/2002 **# of Pages:** 4
File Break: 01.03

234854 **COMMENTS ON DRAFT EXPANDED SITE INSPECTION REPORT**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: DONALD SMITH US EPA REGION 1
Doc Type: LETTER
Doc Date: 10/16/2002 **# of Pages:** 2
File Break: 01.03

01: SITE ASSESSMENT

234855 **FINAL EXPANDED SITE INSPECTION REPORT**

Author: WESTON SOLUTIONS INC
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 01/21/2003
# of Pages: 184
File Break: 01.03

02: REMOVAL RESPONSE

48547 **POLREP 1, REMOVAL START - OCTOBER 3, 2002**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee:
Doc Type: MEMO
Doc Date: 01/02/2002
# of Pages: 3
File Break: 02.04

234850 **REMOVAL PROGRAM RELIMINARY ASSESSMENT / SITE INVESTIGATION (PA/SI) REPORT, 4 THROUGH 6 SEPTEMBER 2002**

Author: WESTON SOLUTIONS INC
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 11/01/2002
# of Pages: 68
File Break: 02.02

02: REMOVAL RESPONSE

234862 **RESULTS FOR AMRO #0212169**

Author: AMRO ENVIRONMENTAL LABORATORIES CORP
Addressee: JOSEPH SCHMIDL ROY F WESTON INC
Doc Type: SAMPLING & ANALYSIS DATA
Doc Date: 01/08/2003 **# of Pages:** 45
File Break: 02.03

204865 **ACTION MEMORANDUM - TIME CRITICAL REMOVAL ACTION**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee: STEVEN R NOVICK US EPA REGION 1
SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Doc Type: MEMO
Doc Date: 05/12/2004 **# of Pages:** 13
File Break: 02.09

234861 **TECHNICAL ALTERNATIVES ANALYSIS REPORT FOR DRUM REMOVAL**

Author: SHAW ENVIRONMENTAL INC
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 06/21/2004 **# of Pages:** 80
File Break: 02.02

02: REMOVAL RESPONSE

204887 **POLREP (FINAL)**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee:
Doc Type: REPORT
Doc Date: 07/09/2004 **# of Pages:** 6
File Break: 02.04

204886 **POLREP NO 1**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee:
Doc Type: REPORT
Doc Date: 07/30/2004 **# of Pages:** 7
File Break: 02.04

204897 **ACTION MEMORANDUM ADDENDUM / ACTION MEMORANDUM COMPLETION 09/24/2004**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Doc Type: MEMO
Doc Date: 09/22/2004 **# of Pages:** 8
File Break: 02.09

02: REMOVAL RESPONSE

234860 **DISPOSITION OF CONTAMINATED SOILS RELATED TO INTERCEPTOR TRENCH CONSTRUCTION**

Author: JOHN REGAN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
ATHANASIOS HATZOPOUL0S US EPA REGION 1
Doc Type: LETTER
Doc Date: 09/23/2004 **# of Pages:** 2
File Break: 02.01

03: REMEDIAL INVESTIGATION (RI)

234863 **RESIDENTIAL WELL SAMPLING RESULTS FOR 172 SOUTH STREET**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: ROBERT HAWKINS TROY (NH) RESIDENT
Doc Type: LETTER
Doc Date: 09/15/2004 **# of Pages:** 4
File Break: 03.02

234864 **RESIDENTIAL WELL SAMPLING RESULTS FOR 150 ROCKWOOD POND ROAD**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: RICHARD PASTOR FITZWILLIAM (NH) RESIDENT
Doc Type: LETTER
Doc Date: 09/15/2004 **# of Pages:** 13
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234865 **WATER QUALITY ANALYSIS FROM THE 2004 SUMMER SAMPLING ROUND**

Author: LEAH DESMARAIS NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
Addressee: ROGER F DUWART US EPA REGION 1
Doc Type: LETTER
Doc Date: 09/30/2004 **# of Pages:** 113
File Break: 03.02

234901 **SITE SAFETY AND HEALTH PLAN FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS)**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 11/01/2004 **# of Pages:** 466
File Break: 03.04

234866 **RESIDENTIAL WELL SAMPLING RESULTS FOR 162 ROCKWOOD POND ROAD**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: CURTIS BULLARD FITZWILLIAM (NH) RESIDENT
Doc Type: LETTER
Doc Date: 11/30/2004 **# of Pages:** 6
File Break: 03.02

234867 **RESIDENTIAL WELL SAMPLING RESULTS FOR 117 SOUTH STREET**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: MARTIN STANTON TROY (NH) RESIDENT
Doc Type: LETTER
Doc Date: 11/30/2004 **# of Pages:** 6
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234868 **SAMPLING AND ANALYSIS PLAN FOR REMEDIAL INVESTIGATION (RI), VOLUME 1 OF 2**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 12/01/2004
# of Pages: 505
File Break: 03.02

234869 **SAMPLING AND ANALYSIS PLAN FOR REMEDIAL INVESTIGATION (RI), VOLUME 2 OF 2**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 12/01/2004
# of Pages: 935
File Break: 03.02

234870 **TIER 2 DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 15/GROUNDWATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 01/19/2005
# of Pages: 32
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234871 **TIER 2 ORGANIC DATA VALIDATION, 1,4-DIOXANE: 9/GROUNDWATERS**

Author: ELIZABETH DECOLA METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 01/20/2005 **# of Pages:** 11
File Break: 03.02

Doc Type: LETTER

234872 **TIER 2 DATA VALIDATION, ALKALINITY: 9/SURFACE WATERS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 01/27/2005 **# of Pages:** 10
File Break: 03.02

Doc Type: LETTER

234873 **TIER 2 DATA VALIDATION, VOLATILE ORAGINC COMPOUNDS (VOCS): 12/SURFACE WATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 01/28/2005 **# of Pages:** 18
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234874 **TIER 2 DATA VALIDATION, TOTAL ORGANIC CARBON (TOC) AND AMMONIA: 9/GROUNDWATERS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/02/2005 **# of Pages:** 12
File Break: 03.02

Doc Type: LETTER

234875 **TIER 2 DATA VALIDATION, TOTAL ORGANIC CARBON (TOC) AND PH: 9/SURFACE SOILS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/03/2005 **# of Pages:** 14
File Break: 03.02

Doc Type: LETTER

234876 **TIER 2 DATA VALIDATION, TOTAL ORGANIC CARBON (TOC) AND PH: 9/SEDIMENTS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/03/2005 **# of Pages:** 13
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234877 **TIER 2 DATA VALIDATION, INORGANIC ANIONS: 9/GROUNDWATERS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/03/2005 **# of Pages:** 11
File Break: 03.02

Doc Type: LETTER

234878 **TIER 2 DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 9/SOIL**

Author: ELIZABETH DECOLA METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/04/2005 **# of Pages:** 42
File Break: 03.02

Doc Type: LETTER

234879 **TIER 2 DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 9/SEDIMENT**

Author: ELIZABETH DECOLA METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/04/2005 **# of Pages:** 24
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234880 **TIER 2 DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 6/GROUNDWATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/14/2005 **# of Pages:** 26
File Break: 03.02

Doc Type: LETTER

234881 **TIER 2 INORGANIC DATA VALIDATION, AVS/SEM: 9/SEDIMENT**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/15/2005 **# of Pages:** 18
File Break: 03.02

Doc Type: LETTER

234882 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION METALS PLUS BORON: 9/SOIL**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/16/2005 **# of Pages:** 20
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234883 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 9/SEDIMENTS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/22/2005 **# of Pages:** 34
File Break: 03.02

Doc Type: LETTER

234884 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 5/GROUNDWATERS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/22/2005 **# of Pages:** 39
File Break: 03.02

Doc Type: LETTER

234885 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION TOTAL METALS PLUS BORON: 12/SURFACE WATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 02/23/2005 **# of Pages:** 17
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234886 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION TOTAL METALS PLUS BORON: 17/GROUNDWATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/23/2005 **# of Pages:** 20
File Break: 03.02

234887 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION TOTAL METALS PLUS BORON: 9/SEDIMENT**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/23/2005 **# of Pages:** 16
File Break: 03.02

234888 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 9/SOILS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/24/2005 **# of Pages:** 40
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234889 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION METALS PLUS BORON: 7/GROUNDWATER**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: RICHARD PURDY METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/24/2005 **# of Pages:** 17
File Break: 03.02

234890 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 12/SURFACE WATERS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/25/2005 **# of Pages:** 40
File Break: 03.02

234891 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 16/GROUNDWATERS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 02/25/2005 **# of Pages:** 51
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234892 **TIER 2 ORGANIC DATA VALIDATION, RESUBMITTAL, SEMIVOLATILES: 9/SOILS**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/01/2005 **# of Pages:** 41
File Break: 03.02

Doc Type: LETTER

234893 **TIER 2 ORGANIC DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS: 5/AIR**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/02/2005 **# of Pages:** 18
File Break: 03.02

Doc Type: LETTER

234894 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION METALS PLUS BORON: 7/SOIL**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/16/2005 **# of Pages:** 17
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234895 **TIER 2 INORGANIC DATA VALIDATION, LOW CONCENTRATION METALS PLUS BORON: 17/SOIL**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 03/16/2005 **# of Pages:** 19
File Break: 03.02

234896 **TIER 2 MEE/CO2 AND VFA DATA VALIDATION, METHANE, ETHANE, AND CARBON DIOXIDE (MEE/CO2): 9/GROUNDWATERS, VOLATILE FATTY ACIDS (VFA): 9/GROUNDWATERS**

Author: ELIZABETH DECOLA METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 03/17/2005 **# of Pages:** 15
File Break: 03.02

234897 **TIER 2 ORGANIC DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 10/SOILS**

Author: RYAN BARTOSZ METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: LETTER
Doc Date: 03/18/2005 **# of Pages:** 24
File Break: 03.02

03: REMEDIAL INVESTIGATION (RI)

234898 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 13/SOILS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/31/2005 **# of Pages:** 40
File Break: 03.02

Doc Type: LETTER

234899 **TIER 2 ORGANIC DATA VALIDATION, SEMIVOLATILES: 11/SOILS**

Author: CONSTANCE LAPITE METCALF & EDDY
Addressee: KRISTIN M RUTHERFORD METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/31/2005 **# of Pages:** 41
File Break: 03.02

Doc Type: LETTER

234900 **TIER 2 ORGANIC DATA VALIDATION, VOLATILE ORGANIC COMPOUNDS (VOCS): 14/SOILS**

Author: RYAN BARTOSZ METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 03/31/2005 **# of Pages:** 31
File Break: 03.02

Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

234992 **COMMENTS ON DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT: TEXT, TABLES, AND APPENDICES**

Author: LORI S SIEGEL NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: KAREN WEDLOCK-HUNT METCALF & EDDY
Doc Type: LETTER
Doc Date: 04/18/2005 **# of Pages:** 3
File Break: 03.10

234991 **COMMENTS ON DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT**

Author: JAMES CHOW US EPA REGION 1
Addressee: KAREN WEDLOCK-HUNT METCALF & EDDY
Doc Type: LETTER
Doc Date: 04/29/2005 **# of Pages:** 9
File Break: 03.10

234993 **COMMENTS ON DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT**

Author: KENNETH MUNNEY US DOI/US FISH & WILDLIFE SERVICE
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 04/29/2005 **# of Pages:** 4
File Break: 03.10

234987 **COMMENTS ON HUMAN HEALTH RISK ASSESSMENT**

Author: DENNIS A PINSKI NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 05/03/2005 **# of Pages:** 2
File Break: 03.10

03: REMEDIAL INVESTIGATION (RI)

234986 **COMMENTS ON DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee:
Doc Type: LETTER
Doc Date: 05/06/2005 **# of Pages:** 2
File Break: 03.10

234995 **COMMENTS ON DRAFT REMEDIAL INVESTIGATION (RI)**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee:
Doc Type: LETTER
Doc Date: 05/06/2005 **# of Pages:** 3
File Break: 03.06

234985 **COMMENTS ON DRAFT REMEDIAL INVESTIGATION (RI) REPORT AND DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: JAMES CHOW US EPA REGION 1
Addressee: KAREN WEDLOCK-HUNT METCALF & EDDY
Doc Type: LETTER
Doc Date: 05/13/2005 **# of Pages:** 7
File Break: 03.06

235005 **DRAFT FINAL REMEDIAL INVESTIGATION (RI), VOLUME 1 OF 3 [WITH TRANSMITTAL DATED 07/08/2005]**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Date: 07/01/2005 **# of Pages:** 1
File Break: 03.06

03: REMEDIAL INVESTIGATION (RI)

235006 **DRAFT FINAL REMEDIAL INVESTIGATION (RI), VOLUME 2 OF 3, APPENDIX J, DRAFT FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Date: 07/01/2005
# of Pages: 1
File Break: 03.10

235007 **DRAFT FINAL REMEDIAL INVESTIGATION (RI), VOLUME 3 OF 3, APPENDIX K, DRAFT FINAL BASELINE ECOLOGICAL RISK ASSESSMENT**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Date: 07/01/2005
# of Pages: 1
File Break: 03.10

237257 **REUSE ASSESSMENT**

Author: US EPA REGION 1
Addressee:
Doc Type: REPORT
Doc Date: 07/01/2005
# of Pages: 22
File Break: 03.04

234988 **RESPONSE TO COMMENTS ON DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005
# of Pages: 3
File Break: 03.10

03: REMEDIAL INVESTIGATION (RI)

234989 **RESPONSE TO COMMENTS ON DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 3
File Break: 03.10

234990 **RESPONSE TO COMMENTS ON DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 3
File Break: 03.10

234994 **RESPONSE TO COMMENTS ON DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 17
File Break: 03.10

234996 **RESPONSE TO COMMENTS ON DRAFT REMEDIAL INVESTIGATION (RI)**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 5
File Break: 03.06

03: REMEDIAL INVESTIGATION (RI)

234997 **RESPONSE TO COMMENTS ON DRAFT REMEDIAL INVESTIGATION (RI)**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 4
File Break: 03.06

237271 **TRANSMITTAL FOR RESUSE ASSESSMENT**

Author: JAMES CHOW US EPA REGION 1
Addressee: GLENN T SHATTLER TROY (NH) TOWN OF
Doc Type: LETTER
Doc Date: 07/20/2005 **# of Pages:** 1
File Break: 03.04

237272 **TRANSMITTAL FOR RESUSE ASSESSMENT**

Author: JAMES CHOW US EPA REGION 1
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 07/20/2005 **# of Pages:** 1
File Break: 03.04

03: REMEDIAL INVESTIGATION (RI)

238280 **TIER 2 ORGANIC DATA VALIDATION REPORT FOR CASE #0251M, SDG D05917, RESUBMITTAL, ORIGINALLY SUBMITTED 2/22/05**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: REPORT
Doc Date: 08/31/2005 **# of Pages:** 26
File Break: 03.02

238282 **TIER 2 ORGANIC DATA VALIDATION REPORT FOR CASE #0252M, SDG D05962, RESUBMITTAL, ORIGINALLY SUBMITTED 2/22/05**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: REPORT
Doc Date: 08/31/2005 **# of Pages:** 22
File Break: 03.02

237258 **HEALTH CONSULTATION, WITH TRANSMITTAL FROM GARY PERLMAN, ATSDR TO JAMES CHOW, US EPA REGION 1 DATED 9/12/2005**

Author: NH DEPT OF HEALTH & HUMAN SERVICES
Addressee:
Doc Type: REPORT
Doc Date: 09/01/2005 **# of Pages:** 9
File Break: 03.09

03: REMEDIAL INVESTIGATION (RI)

237374 **FINAL REMEDIAL INVESTIGATION (RI) VOLUME 1 OF 3**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: REPORT
Doc Date: 09/01/2005 **# of Pages:** 1
File Break: 03.06

237375 **FINAL REMEDIAL INVESTIGATION (RI) VOLUME 2 OF 3 - APPENDIX J, FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: REPORT
Doc Date: 09/01/2005 **# of Pages:** 1
File Break: 03.06

237376 **FINAL REMEDIAL INVESTIGATION (RI) VOLUME 3 OF 3 - APPENDIX K, FINAL BASELINE ECOLOGICAL RISK ASSESSMENT**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: REPORT
Doc Date: 09/01/2005 **# of Pages:** 1
File Break: 03.06

03: REMEDIAL INVESTIGATION (RI)

238278 **TIER 2 ORGANIC DATA VALIDATION REPORT FOR CASE #0252M, SDG D05967, RESUBMITTAL, ORIGINALLY SUBMITTED 2/25/05**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 09/06/2005 **# of Pages:** 42
File Break: 03.02

Doc Type: REPORT

238279 **TIER 2 ORGANIC DATA VALIDATION REPORT FOR CASE #0251M, SDG D05892, RESUBMITTAL, ORIGINALLY SUBMITTED 2/25/05**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 09/09/2005 **# of Pages:** 30
File Break: 03.02

Doc Type: REPORT

238281 **TIER 2 DATA VALIDATION REPORT FOR CASE #0251M, SDG D05938, RESUBMITTAL, ORIGINALLY SUBMITTED 2/04/05**

Author: ELIZABETH DECOLA METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ANDREW SCHKUTA METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1

Doc Date: 09/09/2005 **# of Pages:** 22
File Break: 03.02

Doc Type: REPORT

03: REMEDIAL INVESTIGATION (RI)

238283 **TIER 2 ORGANIC DATA VALIDATION REPORT FOR CASE #0251M, SDG D05939, RESUBMITTAL, ORIGINALLY SUBMITTED 3/01/05**

Author: PAULA DIMATTEI METCALF & EDDY
Addressee: CONSTANCE LAPITE METCALF & EDDY
ROBERT L SHOEMAKER METCALF & EDDY
DEBORAH A TRUINI METCALF & EDDY
CHRISTINE CLARK US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/09/2005 **# of Pages:** 29
File Break: 03.02

04: FEASIBILITY STUDY (FS)

234999 **COMMENTS ON DRAFT FEASIBILITY STUDY (FS) REPORT**

Author: NH DEPT OF ENVIRONMENTAL SERVICES
Addressee:
Doc Type: LETTER
Doc Date: 06/09/2005 **# of Pages:** 2
File Break: 04.06

234998 **COMMENTS ON DRAFT FEASIBILITY STUDY (FS) REPORT**

Author: JAMES CHOW US EPA REGION 1
Addressee: KAREN WEDLOCK-HUNT METCALF & EDDY
Doc Type: LETTER
Doc Date: 06/10/2005 **# of Pages:** 6
File Break: 04.06

04: FEASIBILITY STUDY (FS)

235004 **DRAFT FINAL FEASIBILITY STUDY (FS)**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Date: 07/01/2005 **# of Pages:** 1
File Break: 04.06

235008 **PROPOSED PLAN**

Author: US EPA REGION 1
Addressee:
Doc Type: FACT SHEET
Doc Date: 07/01/2005 **# of Pages:** 16
File Break: 04.09

235000 **RESPONSE TO COMMENTS ON DRAFT FEASIBILITY STUDY (FS) REPORT**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 8
File Break: 04.06

235001 **RESPONSE TO COMMENTS ON DRAFT FEASIBILITY STUDY (FS) REPORT**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 3
File Break: 04.06

04: FEASIBILITY STUDY (FS)

235002 **RESPONSE TO COMMENTS ON DRAFT FEASIBILITY STUDY (FS) REPORT**

Author: METCALF & EDDY
Addressee:
Doc Type: LETTER
Doc Date: 07/08/2005 **# of Pages:** 4
File Break: 04.06

237377 **FINAL FEASIBILITY STUDY (FS)**

Author: METCALF AND EDDY, INC
Addressee:
Doc Type: REPORT
Doc Date: 09/01/2005 **# of Pages:** 1
File Break: 04.06

05: RECORD OF DECISION (ROD)

237268 **COMMENTS ON THE PROPOSED PLAN**

Author: JANE MAYER
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/03/2005 **# of Pages:** 2
File Break: 05.03

05: RECORD OF DECISION (ROD)

237269 **E-MAIL CONTAINING COMMENTS ON THE PROPOSED PLAN**

Author: CARL GOLDKNOPF
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/03/2005 **# of Pages:** 1
File Break: 05.03

237260 **E-MAIL FORWARDING COMMENTS ON THE PROPOSED PLAN**

Author: JAMES CHOW US EPA REGION 1
Addressee: ANGELA BONARRIGO US EPA REGION 1
Doc Type: MEMO
Doc Date: 08/18/2005 **# of Pages:** 2
File Break: 05.03

237261 **E-MAIL CONTAINING COMMENTS ON THE PROPOSED PLAN**

Author: NATALIE REID TROY (NH) RESIDENT
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: MEMO
Doc Date: 08/18/2005 **# of Pages:** 2
File Break: 05.03

237263 **E-MAIL CONTAINING COMMENTS ON THE PROPOSED PLAN**

Author: RALPH L WENTWORTH TROY (NH) RESIDENT
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: MEMO
Doc Date: 08/18/2005 **# of Pages:** 2
File Break: 05.03

05: RECORD OF DECISION (ROD)

237264 **COMMENTS ON THE PROPOSED PLAN**

Author: FRANK BEQUAERT
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/18/2005 **# of Pages:** 1
File Break: 05.03

237259 **E-MAIL FORWARDING COMMENTS ON THE PROPOSED PLAN**

Author: JAMES CHOW US EPA REGION 1
Addressee: ANGELA BONARRIGO US EPA REGION 1
DAVID M PETERSON US EPA REGION 1
Doc Type: MEMO
Doc Date: 08/19/2005 **# of Pages:** 1
File Break: 05.03

237262 **E-MAIL CONTAINING COMMENTS ON THE PROPOSED PLAN**

Author: JAMES CHOW US EPA REGION 1
Addressee:
Doc Type: MEMO
Doc Date: 08/19/2005 **# of Pages:** 1
File Break: 05.03

05: RECORD OF DECISION (ROD)

237265 **COMMENTS ON THE PROPOSED PLAN**

Author: KENNETH MUNNEY US DOI/US FISH & WILDLIFE SERVICE
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/19/2005 **# of Pages:** 2
File Break: 05.03

237266 **COMMENTS ON THE PROPOSED PLAN**

Author: SHARON WOJCIECHOWSKI
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/19/2005 **# of Pages:** 2
File Break: 05.03

237267 **COMMENTS ON THE PROPOSED PLAN**

Author: F I MERLONE TROY (NH) RESIDENT
Addressee: JAMES CHOW US EPA REGION 1
Doc Type: LETTER
Doc Date: 08/19/2005 **# of Pages:** 2
File Break: 05.03

238295 **STATE DECLARATION OF CONCURRENCE**

Author: ANTHONY P GIUNTA NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: SUSAN STUDLIEN US EPA REGION 1
Doc Type: LETTER
Doc Date: 09/23/2005 **# of Pages:** 4
File Break: 05.01

05: RECORD OF DECISION (ROD)

237040 **RECORD OF DECISION (ROD)**

Author: RICHARD A CAVAGNERO US EPA REGION 1
Addressee:
Doc Type: RECORD OF DECISION

Doc Date: 09/30/2005 **# of Pages:** 286
File Break: 05.04

09: STATE COORDINATION

234902 **LETTER REGARDING UNAUTHORIZED DUMP SITE**

Author: THOMAS L SWEENEY NH BUREAU OF SOLID WASTE MANAGEMENT
Addressee: CHARLES J FORD TROY MILLS INC
Doc Type: LETTER

Doc Date: 09/15/1978 **# of Pages:** 2
File Break: 09.10

234903 **SITE VISIT MEMO**

Author: TOM ROY NH BUREAU OF SOLID WASTE MANAGEMENT
Addressee:
Doc Type: MEMO

Doc Date: 10/05/1978 **# of Pages:** 2
File Break: 09.10

09: STATE COORDINATION

234904 **APPLICATION FOR PERMIT FOR SANITARY LANDFILL**

Author: CARL H PATTEN TROY MILLS INC
Addressee: PAUL M SANBORN NH DEPT OF HEALTH & HUMAN SERVICES
Doc Type: LETTER
Doc Date: 10/05/1978
# of Pages: 1
File Break: 09.10

234856 **REFUSAL OF REQUEST TO OPERATE A SANITARY LANDFILL ON PROPERTY OWNED BY TROY MILLS, INC.**

Author: MAYNARD H MIRES NH DEPT OF HEALTH & HUMAN SERVICES
Addressee: CARL H PATTEN TROY MILLS INC
Doc Type: LETTER
Doc Date: 10/24/1978
# of Pages: 1
File Break: 09.10

234905 **ANALYSIS OF SAMPLES FROM UNDERDRAIN OF DUMP SITE**

Author: ROBERT W NIEDRACH CHEMSERVE
Addressee: CARL H PATTEN TROY MILLS INC
Doc Type: LETTER
Doc Date: 12/06/1979
# of Pages: 2
File Break: 09.10

234906 **LEACHATE SAMPLES**

Author: PAUL J CAVICCHI NH WATER SUPPLY AND POLLUTION CONTROL COMMISSION
Addressee: THOMAS L SWEENEY NH BUREAU OF SOLID WASTE MANAGEMENT
Doc Type: MEMO
Doc Date: 08/08/1980
# of Pages: 6
File Break: 09.10

09: STATE COORDINATION

234907 **SITE INSPECTION MEMO**

Author: MARK GALLUP NH BUREAU OF SOLID WASTE MANAGEMENT
Addressee: THOMAS L SWEENEY NH BUREAU OF SOLID WASTE MANAGEMENT
Doc Type: MEMO
Doc Date: 08/26/1980 **# of Pages:** 2
File Break: 09.10

234908 **DISCOVERY OF LEACHATE AT LOWER DUMP AND REQUIREMENT TO PLACE TEST PITS AND WELLPOINTS**

Author: THOMAS L SWEENEY NH BUREAU OF SOLID WASTE MANAGEMENT
Addressee: CARL H PATTEN TROY MILLS INC
Doc Type: LETTER
Doc Date: 10/23/1980 **# of Pages:** 2
File Break: 09.10

234909 **NOTIFICATION OF HAZARDOUS WASTE SITE**

Author: BARRETT F RIPLEY TROY MILLS INC
Addressee: US EPA REGION 1
Doc Type: FORM
Doc Date: 06/17/1981 **# of Pages:** 2
File Break: 09.10

234910 **PHASE 1 REPORT WITH TRANSMITTAL**

Author: BARRETT F RIPLEY TROY MILLS INC
Addressee: MARK GALLUP NH BUREAU OF SOLID WASTE MANAGEMENT
Doc Type: LETTER
Doc Date: 08/14/1981 **# of Pages:** 16
File Break: 09.10

09: STATE COORDINATION

234911 **TEST DRILLING, INSTALLATION OF MONITORING WELLS, AND WATER QUALITYASSESMENT, PHASE 3 REPORT**

Author: NORMANDEAU ASSOCIATES INC
Addressee: TROY MILLS INC
Doc Date: 07/01/1982 **# of Pages:** 18
File Break: 09.10
Doc Type: REPORT

234912 **LETTER REPORT OF WATER QUALITY MONITORING, MAY 16, 1983 SAMPLING**

Author: NORMANDEAU ASSOCIATES INC
Addressee: TROY MILLS INC
Doc Date: 08/01/1983 **# of Pages:** 23
File Break: 09.10
Doc Type: REPORT

234913 **LANDFILL INVESTIGATION AND WASTE CHARACTERIZATION**

Author: NORMANDEAU ASSOCIATES INC
Addressee: TROY MILLS INC
Doc Date: 04/01/1984 **# of Pages:** 118
File Break: 09.10
Doc Type: REPORT

234914 **SEISMIC INVESTIGATION, INSTALLATION OF ADDITIONAL MONITORING WELLS, ADDITIONAL TOPOGRAPHIC SURVEYING, AND WATER QUALITY MONITORING**

Author: NORMANDEAU ASSOCIATES INC
Addressee: TROY MILLS INC
Doc Date: 04/01/1984 **# of Pages:** 33
File Break: 09.10
Doc Type: REPORT

09: STATE COORDINATION

234915 **LETTER REPORT OF WATER QUALITY MONITORING, JULY 16, 1984 SAMPLING**

Author: NORMANDEAU ASSOCIATES INC
Addressee: TROY MILLS INC
Doc Date: 08/01/1984 **# of Pages:** 39
File Break: 09.10
Doc Type: REPORT

234916 **LEVEL 1 HUMAN HEALTH RISK ASSESSMENT**

Author: CHAS T MAIN INC
Addressee: TROY MILLS INC
Doc Date: 03/01/1986 **# of Pages:** 27
File Break: 09.10
Doc Type: REPORT

234917 **SUMMARY OF WASTE CHARACTERISTICS INFORMATION REVIEW**

Author: TROY MILLS INC
Addressee: RATH YOUNG & PIGNATELLI PA
Doc Date: 06/29/1993 **# of Pages:** 7
File Break: 09.10
Doc Type: MEMO

234918 **SUMMARY OF INFORMATION TO BE PRESENTED TO NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES)**

Author: ROBERT A MULLIN GEI CONSULTANTS INC
Addressee: SHERILYN BURNETT YOUNG RATH YOUNG & PIGNATELLI
Doc Date: 02/18/1994 **# of Pages:** 7
File Break: 09.10
Doc Type: LETTER

09: STATE COORDINATION

234919 **PHASE 1 PRE-DESIGN STUDIES - VOLUME 1**

Author: GEI CONSULTANTS INC
Addressee: RATH YOUNG & PIGNATELLI PA
TROY MILLS INC
Doc Date: 10/05/1995 **# of Pages:** 25
File Break: 09.10
Doc Type: REPORT

234920 **TECHNICAL MEMORANDUM, PHASE 2 PRE-DESIGN INVESTIGATION**

Author: GEOINSIGHT INC
Addressee: RATH YOUNG & PIGNATELLI PA
TROY MILLS INC
Doc Date: 08/07/1998 **# of Pages:** 68
File Break: 09.10
Doc Type: REPORT

234921 **PHASE 2 PRE-DESIGN REPORT AND GROUNDWATER MANAGEMENT PERMIT APPLICATION**

Author: GEOINSIGHT INC
Addressee: RATH YOUNG & PIGNATELLI PA
TROY MILLS INC
Doc Date: 09/30/1998 **# of Pages:** 469
File Break: 09.10
Doc Type: REPORT

09: STATE COORDINATION

234922 **COMMENTS ON PROPOSED FUNNEL-AND-GATE REMEDY**

Author: PAUL RYDEL NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: BARRETT F RIPLEY TROY MILLS INC
Doc Type: LETTER
Doc Date: 06/21/1999 **# of Pages:** 4
File Break: 09.10

234923 **SOLID WASTE LANDFILL CLOSURE SCHEDULE**

Author: SHELLEY F BOBOWSKI GEOINSIGHT INC
Addressee: JOHN GILBERT GEOINSIGHT INC
MICHAEL C PENNEY GEOINSIGHT INC
DOUG KEMP NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 11/03/1999 **# of Pages:** 4
File Break: 09.10

234924 **SITE ASSESSMENT FOR SAND POND DAM SITE AND TWO DAM SITES**

Author: THOMAS L SWEENEY DUFRESNE-HENRY INC
Addressee: DOUG KEMP NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 07/13/2000 **# of Pages:** 3
File Break: 09.10

09: STATE COORDINATION

234925 **DEFERMENT OF REMEDIATION DUE TO FUNDING**

Author: PHILIP J OBRIEN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: BARRETT F RIPLEY TROY MILLS INC
Doc Type: LETTER
Doc Date: 12/14/2000 **# of Pages:** 2
File Break: 09.10

234926 **TEST PIT LOGS AND TEST PIT LOCATION PLAN**

Author: SHELLEY F BOBOWSKI GEOINSIGHT INC
Addressee: DOUG KEMP NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: MEMO
Doc Date: 02/23/2001 **# of Pages:** 8
File Break: 09.10

234944 **CONTINUED GROUNDWATER MONITORING, DECEMBER 2000 MONITORING EVENT**

Author: JOHN GILBERT GEOINSIGHT INC
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 04/27/2001 **# of Pages:** 8
File Break: 09.10

234945 **REQUEST FOR INFORMATION**

Author: PHILIP J OBRIEN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JONATHAN SISTARE JAFFREY (NH) TOWN OF
Doc Type: LETTER
Doc Date: 06/04/2001 **# of Pages:** 3
File Break: 09.10

09: STATE COORDINATION

234946 **GROUNDWATER MANAGEMENT PERMIT [WITH TRANSMITTAL]**

Author: FREDERICK J MCGARRY NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: TROY MILLS INC
Doc Type: REPORT
Doc Date: 07/17/2001 **# of Pages:** 4
File Break: 09.10

234947 **RESPONSE TO REQUEST FOR ASSISTANCE AT FORMER DRUM DISPOSAL AREA**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: DANIEL J BISACCIO TROY MILLS CONSERVATION COMMISSION
Doc Type: LETTER
Doc Date: 07/24/2001 **# of Pages:** 7
File Break: 09.10

234948 **SEDIMENT AND SURFACE WATER SAMPLES, SAND POND**

Author: CARROLL M BROWN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: MEMO
Doc Date: 11/09/2001 **# of Pages:** 3
File Break: 09.10

234949 **SEDIMENT AND WATER SAMPLING SAND DAM POND**

Author: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: ROBERT W HARKINS TROY (NH) TOWN OF
Doc Type: LETTER
Doc Date: 11/13/2001 **# of Pages:** 3
File Break: 09.10

09: STATE COORDINATION

234950 **REPORT OF SITE VISIT DISPOSAL OF MATERIALS BEYOND THE SCOPE OF AUTHORIZATION**

Author: RICHARD S REED NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: BARRETT F RIPLEY TROY MILLS INC
Doc Type: LETTER
Doc Date: 12/04/2001 **# of Pages:** 1
File Break: 09.10

234951 **REQUEST TO CONFIRM UNDERSTANDING OF LIMITATIONS ON USE OF LANDFILL**

Author: PHILIP J OBRIEN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: BARRETT F RIPLEY TROY MILLS INC
Doc Type: LETTER
Doc Date: 12/20/2001 **# of Pages:** 2
File Break: 09.10

234952 **RESPONSE TO NHDES LETTER OF DECEMBER 20, 2001**

Author: BARRETT F RIPLEY TROY MILLS INC
Addressee: PHILIP J OBRIEN NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 12/31/2001 **# of Pages:** 1
File Break: 09.10

234953 **SAMPLING AND ANALYSIS OF LNAPL**

Author: LUCIO S BARINELLI NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 01/10/2002 **# of Pages:** 9
File Break: 09.10

09: STATE COORDINATION

234954 **REQUEST FOR ACTION ON THE "CONTINGENCY PLAN, REMEDIAL ACTIVITIES"**

Author: JOHN REGAN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
BARRETT F RIPLEY TROY MILLS INC
Doc Type: LETTER
Doc Date: 02/15/2002 **# of Pages:** 2
File Break: 09.10

234955 **INVENTORIES OF WASTES RELATED TO DISCONTINUED OPERATIONS**

Author: BARRETT F RIPLEY TROY MILLS INC
Addressee: JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 02/20/2002 **# of Pages:** 6
File Break: 09.10

234956 **GMP WATER QUALITY MONITORING, OCTOBER 2002 MONITORING EVENT**

Author: MICHAEL F DACEY GEOINSIGHT INC
Addressee: JOHN GILBERT GEOINSIGHT INC
JOHN L SPLENDORE NH DEPT OF ENVIRONMENTAL SERVICES
Doc Type: LETTER
Doc Date: 01/06/2003 **# of Pages:** 144
File Break: 09.10

09: STATE COORDINATION

234957 **REQUEST FOR ASSISTANCE IN GAINING FEDERAL REMOVAL FUNDING**

Author: LOWELL B MCCULLEY TROY (NH) TOWN OF
Addressee: GLENN T SHATTLER TROY (NH) TOWN OF
EDWARD F THOMAS TROY (NH) TOWN OF
CRAIG BENSON NH GOVERNOR

Doc Date: 01/30/2003 **# of Pages:** 2
File Break: 09.10

Doc Type: LETTER

237256 **TROY MILLS LANDFILL - GROUNDWATER USE AND VALUE DETERMINATION (DES #198050820)**

Author: MICHAEL NOLIN NH DEPT OF ENVIRONMENTAL SERVICES
Addressee: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION

Doc Date: 08/30/2005 **# of Pages:** 5
File Break: 09.01

Doc Type: LETTER

13: COMMUNITY RELATIONS

234966 **TROY LANDFILL SITE MAY SEEK SUPERFUND STATUS**

Author: STEPHEN SEITZ UNION LEADER
Addressee:

Doc Date: 01/17/2002 **# of Pages:** 1
File Break: 13.03

Doc Type: NEWS CLIPPING

13: COMMUNITY RELATIONS

234958 **EPA AND NH DES BEGIN JOINT EFFORT TO CONTAIN THE MIGRATION OF CONTAMINANTS FROM THE TROY MILLS LANDFILL IN TROY, NH**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 10/10/2002 **# of Pages:** 3
File Break: 13.03

234967 **TROY TO GET $960,000 FOR POLLUTED MILL SITE**

Author: STEPHEN SEITZ UNION LEADER
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 10/11/2002 **# of Pages:** 1
File Break: 13.03

234968 **POLLUTION WOES EASE IN TROY**

Author: ERIKA COHEN KEENE SENTINEL
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 02/20/2003 **# of Pages:** 2
File Break: 13.03

234959 **EPA PROPOSES TROY MILLS TO SUPERFUND LIST**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 04/30/2003 **# of Pages:** 3
File Break: 13.03

13: COMMUNITY RELATIONS

234969 **EPA EYES TROY LANDFILL FOR CLEANUP**

Author: FOSTERS DAILY DEMOCRAT
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 05/02/2003
# of Pages: 1
File Break: 13.03

234960 **CLEANUP TO BEGIN AT TROY MILLS LANDFILL IN TROY, NEW HAMPSHIRE**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 09/04/2003
# of Pages: 3
File Break: 13.03

234961 **TROY MILLS SITE ADDED TO NATIONAL PRIORITIES LIST (NPL) (SUPERFUND)**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 09/26/2003
# of Pages: 3
File Break: 13.03

234970 **GREGG LAUDS EPA DECISION TO DEDICATE $8 MILLION TO CLEAN-UP OF TROY MILLS SUPERFUND SITE**

Author: JUDD GREGG US SENATE
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 04/08/2004
# of Pages: 1
File Break: 13.03

13: COMMUNITY RELATIONS

234971 **TROY GETS $8 MILLION FOR LANDFILL CLEANUP**

Author: ASSOCIATED PRESS
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 04/09/2004 **# of Pages:** 2
File Break: 13.03

234962 **EPA, NH DES AND CONGRESSIONAL DELEGATION TOUR TROY MILLS LANDFILL SUPERFUND SITE**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 04/30/2004 **# of Pages:** 2
File Break: 13.03

234972 **EPA SETS GOAL FOR MILL WASTE CLEANUP**

Author: NASHUA TELEGRAPH
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 05/04/2004 **# of Pages:** 1
File Break: 13.03

234973 **EPA SAYS TROY MILLS SHOULD BE CLEAN BY YEAR'S END**

Author: BEVERLY WANG FOSTERS DAILY DEMOCRAT
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 05/04/2004 **# of Pages:** 2
File Break: 13.03

13: COMMUNITY RELATIONS

234963 **EPA AND NH DES TO HOLD INFORMATION MEETING ON CLEANUP OF THE TROY MILLS LANDFILL**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 06/30/2004 **# of Pages:** 3
File Break: 13.03

234964 **EPA AND NH OFFICIALS TO HOLD PRESS EVENT FRIDAY AT TROY MILLS LANDFILL SUPERFUND SITE**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 10/21/2004 **# of Pages:** 3
File Break: 13.03

234974 **TROY PLANS SAND PIT FOR TOWN SEWAGE, WOULD BE ON PIECE OF FORMER LANDFILL**

Author: IAN BAGLEY KEENE SENTINEL
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 03/16/2005 **# of Pages:** 3
File Break: 13.03

234965 **WORK CONTINUES AT TROY MILLS SUPERFUND SITE**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 05/06/2005 **# of Pages:** 3
File Break: 13.03

13: COMMUNITY RELATIONS

235003 **COMMUNITY RELATIONS PLAN**

Author: US EPA REGION 1
Addressee:
Doc Type: REPORT
Doc Date: 06/01/2005 **# of Pages:** 20
File Break: 13.02

237255 **COMPREHENSIVE CLEANUP PLAN PROPOSED FOR TROY MILLS LANDFILL SUPERFUND SITE; PUBLIC MEETINGS SCHEDULED FOR JULY 20 AND AUGUST 18**

Author: US EPA REGION 1
Addressee:
Doc Type: PRESS RELEASE
Doc Date: 07/13/2005 **# of Pages:** 3
File Break: 13.03

237254 **PUBLIC COMMENT SOUGHT ON TROY MILLS CLEANUP PLAN**

Author: STEPHEN SEITZ UNION LEADER
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 07/22/2005 **# of Pages:** 3
File Break: 13.03

237270 **TRANSCRIPT OF A PUBLIC HEARING**

Author: US EPA REGION 1
Addressee:
Doc Type: PUBLIC MEETING RECORD
Doc Type: REPORT
Doc Date: 08/18/2005 **# of Pages:** 9
File Break: 13.04

13: COMMUNITY RELATIONS

237253 **TROY MILLS LANDFILL CLEANUP NEARS END**

Author: STEPHEN SEITZ UNION LEADER
Addressee:
Doc Type: NEWS CLIPPING
Doc Date: 08/19/2005 **# of Pages:** 2
File Break: 13.03

14: CONGRESSIONAL RELATIONS

234975 **TRANSMITTAL OF LETTER FROM TROY BOARD OF SELECTMEN REGARDING UPGRADE TO WATER AND SEWER TREATMENT SYSTEMS**

Author: JUDD GREGG US SENATE
Addressee: ROBERT W VARNEY US EPA REGION 1
Doc Type: LETTER
Doc Date: 03/31/2005 **# of Pages:** 3
File Break: 14.01

234976 **RESPONSE TO LETTER REGARDING SITE AND TOWN OF TROY'S UPGRADES TO WATER AND SEWER SYSTEMS**

Author: ROBERT W VARNEY US EPA REGION 1
Addressee: JUDD GREGG US SENATE
Doc Type: LETTER
Doc Date: 04/15/2005 **# of Pages:** 4
File Break: 14.01

14: CONGRESSIONAL RELATIONS

238296 **REQUEST FOR EPA OPINION ON THE TOWN OF TROY'S REQUEST FOR EPA TO CAP THE ROCKWOOD POND LANDFILL WITH REMAINING TROY LANDFILL FUNDS**

Author: JUDD GREGG US SENATE
Addressee: ROBERT W VARNEY US EPA REGION 1
Doc Type: LETTER
Doc Date: 07/13/2005 **# of Pages:** 3
File Break: 14.01

238297 **IN THE MATTER OF THE TOWN OF TROY'S REQUEST FOR EPA TO CAP THE ROCKWOOD POND LANDFILL, EPA DOES NOT HAVE THE AUTHORITY TO ADDRESS THIS AND RECOMMENDS DISCUSSION WITH THE NHDES**

Author: ROBERT W VARNEY US EPA REGION 1
Addressee: JUDD GREGG US SENATE
Doc Type: LETTER
Doc Date: 08/10/2005 **# of Pages:** 3
File Break: 14.01

16: NATURAL RESOURCE TRUSTEE

234978 **TRUSTEE NOTIFICATION FORM [WITH TRANSMITTAL]**

Author: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Addressee: KENNETH FINKELSTEIN US NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Doc Type: FORM
Doc Date: 06/01/2004 **# of Pages:** 3
File Break: 16.04

16: NATURAL RESOURCE TRUSTEE

234979 **TRUSTEE NOTIFICATION FORM [WITH TRANSMITTAL]**

Author: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Addressee: MICHAEL NOLIN NH DEPT OF ENVIRONMENTAL SERVICES
Doc Date: 06/01/2004 **# of Pages:** 3
File Break: 16.04
Doc Type: FORM

234980 **TRUSTEE NOTIFICATION FORM [WITH TRANSMITTAL]**

Author: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Addressee: ANDREW RADDANT US DEPT OF THE INTERIOR
Doc Date: 06/01/2004 **# of Pages:** 3
File Break: 16.04
Doc Type: FORM

234977 **RESPONSE TO NOTIFICATION OF POTENTIAL DAMAGES TO NATURAL RESOURCES FROM HAZARDOUS SUBSTANCES**

Author: ANDREW RADDANT US DEPT OF THE INTERIOR
Addressee: ROGER F DUWART US EPA REGION 1
Doc Date: 07/23/2004 **# of Pages:** 3
File Break: 16.01
Doc Type: LETTER

17: SITE MANAGEMENT RECORDS

27013 **HISTORICAL PHOTOS, DISK 1 OF 4, PROJECT NO. 20101149S [AVAILABLE IN CD FORMAT IN US EPA SUPERFUND RECORDS CENTER, BOSTON, MA]**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Doc Date: 01/01/0001 **# of Pages:** 1
Addressee:
File Break: 17.04
Doc Type: PHOTOGRAPH

27014 **HISTORICAL PHOTOS, DISK 2 OF 4, PROJECT NO. 20101149S [AVAILABLE IN CD FORMAT IN US EPA SUPERFUND RECORDS CENTER, BOSTON, MA]**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Doc Date: 01/01/0001 **# of Pages:** 1
Addressee:
File Break: 17.04
Doc Type: PHOTOGRAPH

27015 **HISTORICAL PHOTOS, DISK 3 OF 4, PROJECT NO. 20101149S [AVAILABLE IN CD FORMAT IN US EPA SUPERFUND RECORDS CENTER, BOSTON, MA]**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Doc Date: 01/01/0001 **# of Pages:** 1
Addressee:
File Break: 17.04
Doc Type: PHOTOGRAPH

27016 **HISTORICAL PHOTOS, DISK 4 OF 4, PROJECT NO. 20101149S [AVAILABLE IN CD FORMAT IN US EPA SUPERFUND RECORDS CENTER, BOSTON, MA]**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Doc Date: 01/01/0001 **# of Pages:** 1
Addressee:
File Break: 17.04
Doc Type: PHOTOGRAPH

17: SITE MANAGEMENT RECORDS

237363 **GUIDE TO PRINCIPLE THREAT AND LOW LEVEL THREAT WASTES**

Author: US EPA - OFFICE OF EMERGENCY & REMEDIAL RESPONSE
Addressee:
Doc Type: REPORT
Doc Date: 11/01/1991 **# of Pages:** 8
File Break: 17.07

234983 **HISTORICAL AERIAL PHOTOGRAPHS**

Author: E TERRENCE SLONECKER US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPI
Addressee: RICHARD WILLEY US EPA REGION 1
Doc Type: MEMO
Doc Type: PHOTOGRAPH
Doc Date: 08/27/2001 **# of Pages:** 4
File Break: 17.04

27235 **AERIAL PHOTOGRAPHIC ANALYSIS OF TROY MILLS LANDFILL SITE, TROY TOWNSHIP, NEW HAMPSHIRE, EPIC BOOK**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Addressee: US EPA REGION 1
Doc Type: PHOTOGRAPH
Doc Date: 11/01/2001 **# of Pages:** 1
File Break: 17.04

64910 **HISTORICAL AEROTRIANGULATION REPORT**

Author: EASTERN TOPOGRAPHICS
Addressee: LOCKHEED MARTIN CORP
Doc Type: REPORT
Doc Date: 12/04/2003 **# of Pages:** 39
File Break: 17.04

17: SITE MANAGEMENT RECORDS

64911 **GIS DATA PROJECT 20401165S CD# 040316_0839**

Author: OFFICE OF RESEARCH & DEVELOPMENT - US EPA
Addressee:
Doc Type: MAP
Doc Date: 12/04/2003 **# of Pages:** 2
File Break: 17.04

234982 **CURRENT PHOTOGRAPHY OF TROY MILLS SUPERFUND SITE**

Author: DONALD GAROFALO US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Addressee: NANCY SMITH US EPA REGION 1
Doc Type: MEMO
Doc Type: PHOTOGRAPH
Doc Date: 12/17/2003 **# of Pages:** 2
File Break: 17.04

234981 **REQUEST FOR ACCESS TO PROPERTY**

Author: ATHANASIOS HATZOPOUL0S US EPA REGION 1
Addressee: THOMAS FLUHARTY TROY MILLS INC
Doc Type: LETTER
Doc Date: 02/28/2005 **# of Pages:** 4
File Break: 17.02

Number of Documents in Collection: 188

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
INTERIM FINAL GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA.

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/1/1988	OSWER #9355.3-01	2002

TITLE
GETTING READY - SCOPING THE RI/FS [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1989	OSWER #9355.3-01FS1	2013

TITLE
FEASIBILITY STUDY - DEVELOPMENT AND SCREENING OF REMEDIAL ACTION ALTERNATIVES [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1989	OSWER #9355.3-01FS3	2018

TITLE
FEASIBILITY STUDY: DETAILED ANALYSIS OF REMEDIAL ACTION ALTERNATIVES [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1990	OSWER #9355.3-01FS4	2019

TITLE
GUIDELINES AND SPECIFICATIONS FOR PREPARING QUALITY ASSURANCE PROGRAM DOCUMENTATION

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1987		2112

TITLE
LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING INORGANICS ANALYSES (DRAFT)

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1988		2113

TITLE
LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING ORGANICS ANALYSES (DRAFT)

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1988		2114

TITLE
PRACTICAL GUIDE FOR GROUND-WATER SAMPLING

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1985	EPA/600/2-85/104	2115

TITLE
SEDIMENT SAMPLING QUALITY ASSURANCE USER'S GUIDE

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1985	EPA/600/4-85/048	2116

TITLE
TEST METHODS FOR EVALUATING SOLID WASTE, LABORATORY MANUAL PHYSICAL/CHEMICAL METHODS, THIRD EDITION (VOLUMES IA, IB, IC, AND II)

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1986		2118

TITLE
TECHNOLOGY SCREENING GUIDE FOR TREATMENT OF CERCLA SOILS AND SLUDGES

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1988	EPA 540/2-88/004	2319

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
TREATMENT TECHNOLOGY BRIEFS: ALTERNATIVES TO HAZARDOUS WASTE LANDFILLS

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1986	EPA/600/8-86/017	2320

TITLE
ADVANCING THE USE OF TREATMENT TECHNOLOGIES FOR SUPERFUND REMEDIES

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/21/1989	OSWER #9355.0-26	2321

TITLE
GUIDE TO TREATMENT TECHNOLOGIES FOR HAZARDOUS WASTES AT SUPERFUND SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989	EPA/540/2-89/052	2322

TITLE
GUIDE ON REMEDIAL ACTIONS FOR CONTAMINATED GROUND WATER [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1989	OSWER #9283.1-2FS	2409

TITLE
CONSIDERATIONS IN GROUND WATER REMEDIATION AT SUPERFUND SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/18/1989	OSWER #9355.4-03	2410

TITLE
GUIDANCE ON REMEDIAL ACTIONS FOR CONTAMINATED GROUND WATER AT SUPERFUND SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1988	OSWER #9283.1-2	2413

TITLE
CERCLA COMPLIANCE WITH OTHER ENVIRONMENTAL STATUTES

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/2/1985	OSWER #9234.0-2	3001

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL (DRAFT)

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/8/1988	OSWER #9234.1-01	3002

TITLE
EPA'S IMPLEMENTATION OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/21/1987		3003

TITLE
ARARs Q'S & A'S [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/1/1989	OSWER #9234.2-01FS	3006

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL - CERCLA COMPLIANCE WITH STATE REQUIREMENTS [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1989	OSWER #9234.2-05FS	3009

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL - CERCLA COMPLIANCE WITH THE CWA AND SDWA [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1990	OSWER #9234.2-06FS	3010

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL - OVERVIEW OF ARARs - FOCUS ON ARAR WAIVERS [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1989	OSWER #9234.2-03FS	3011

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL - SUMMARY OF PART II - CAA, TSCA, AND OTHER STATUTES [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1990	OSWER #9234.2-07FS	3012

TITLE
CERCLA COMPLIANCE WITH OTHER LAWS MANUAL PART II: CLEAN AIR ACT AND OTHER ENVIRONMENTAL STATUTES AND STATE REQUIREMENTS

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/1/1989	OSWER #9234.1-02	3013

TITLE
GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 33992)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5003

TITLE
GUIDELINES FOR EXPOSURE ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34042)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5004

TITLE
GUIDELINES FOR HEALTH ASSESSMENT OF SUSPECT DEVELOPMENTAL TOXICANTS (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34028)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5005

TITLE
GUIDELINES FOR MUTAGENICITY RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER, 24, p. 34006)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5006

TITLE
GUIDELINES FOR THE HEALTH RISK ASSESSMENT OF CHEMICAL MIXTURES (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34014)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5007

TITLE
HEALTH EFFECTS ASSESSMENT DOCUMENTS (58 CHEMICAL PROFILES)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1984	EPA/540/1-86/001-058	5008

TITLE
INTEGRATED RISK INFORMATION SYSTEM (IRIS) [A COMPUTER-BASED HEALTH RISK INFORMATION SYSTEM AVAILABLE THROUGH E-MAIL--BROCHURE ON ACCESS IS INCLUDED]

DOCDATE	OSWER/EPA ID	DOCNUMBER
		5009

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
SUPERFUND EXPOSURE ASSESSMENT MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1988	OSWER #9285.5-1	5013

TITLE
SUPERFUND PUBLIC HEALTH EVALUATION MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/1/1986	OSWER #9285.4-1	5014

TITLE
TOXICOLOGY HANDBOOK

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/1/1985	OSWER #9850.2	5015

TITLE
EXPOSURE FACTORS HANDBOOK

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	EPA/600/8-89/043	5020

TITLE
GUIDANCE FOR SOIL INGESTION RATES

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/27/1989	OSWER #9850.4	5021

TITLE
OPTIONS FOR INTERIM POLICY FOR SOIL INGESTION ASSUMPTIONS

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/4/1988		5022

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME I, HUMAN HEALTH EVALUATION MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/29/1989	OSWER #9285.7-01a	5023

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME II, ENVIRONMENTAL EVALUATION MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989	EPA/540/1-89/001	5024

TITLE
REMEDIAL INVESTIGATION - SITE CHARACTERIZATION AND TREATABILITY STUDIES [QUICK REFERENCE FACT SHEET]

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1989	OSWER #9355.3-01FS2	5025

TITLE
COMMUNITY RELATIONS IN SUPERFUND: A HANDBOOK (INTERIM VERSION). INCLUDES CHAPTER 6, DATED 11/03/88.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1988	OSWER #9230.0-03B	7000

TITLE
INTERIM GUIDANCE ON SUPERFUND SELECTION OF REMEDY

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/24/1986	OSWER #9355.0-19	9000

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
GUIDE TO SELECTING SUPERFUND REMEDIAL ACTIONS

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1990	OSWER #9355.0-27FS	9002

TITLE
COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980. AMENDED BY PL 99-499, 10/17/86.

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/17/1986		C018

TITLE
GUIDANCE ON FEASIBILITY STUDIES UNDER CERCLA.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1985	EPA 540/G-85-003	C034

TITLE
GUIDANCE ON REMEDIAL INVESTIGATIONS UNDER CERCLA.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1985	EPA 540/G-85/002	C035

TITLE
INTERIM GUIDANCE ON COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/9/1987	OSWER 9234.0-05	C055

TITLE
NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN.

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992	OSWER 9200.2-14	C063

TITLE
EVALUATION OF THE APPARENT EFFECTS THRESHOLD (AET) APPROACH FOR ASSESSING SEDIMENT QUALITY. REPORT OF THE SEDIMENT CRITERIA SUBCOMMITTEE.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	SAB-EETFC-89-027	C096

TITLE
INTERIM FINAL GUIDANCE ON SOIL INGESTION RATES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/9/1989	OSWER 9850.4	C099

TITLE
SUPPLEMENTAL RISK ASSESSMENT GUIDANCE FOR THE SUPERFUND PROGRAM. DRAFT FINAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1989	EPA 901/5-89-001	C104

TITLE
GUIDANCE ON REMEDIAL ACTIONS FOR CONTAMINATED GROUND WATER AT SUPERFUND SITES. INTERIM FINAL. DUPLICATE OF 2413.

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1988	OSWER 9283.1-2	C106

TITLE
PUBLIC INVOLVEMENT IN THE SUPERFUND PROGRAM. FALL 1987.

DOCDATE	OSWER/EPA ID	DOCNUMBER
	WH/FS-87-004R	C113

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
ARARS Q'S & A'S. GENERAL POLICY: RCRA, CWA & SDWA. SUPERFUND FACT SHEET. DUPLICATE OF 3006.

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/1/1989	OSWER 9234.2-01/FS-A	C122

TITLE
PRESUMPTIVE REMEDIES: POLICY AND PROCEDURES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1993	OSWER 9355.0-47FS	C143

TITLE
REQUIREMENTS FOR HAZARDOUS WASTE LANDFILL DESIGN, CONSTRUCTION, AND CLOSURE.

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1989	EPA 625/4-89/022	C171

TITLE
FINAL COVERS ON HAZARDOUS WASTE LANDFILLS AND SURFACE IMPOUNDMENTS. TECHNICAL GUIDANCE DOCUMENT.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	EPA 530-SW-89-047	C172

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND. VOLUME I. HUMAN HEALTH EVALUATION MANUAL (PART A). INTERIM FINAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1989	EPA 540/1-89/002	C174

TITLE
STREAMLINING THE RI/FS FOR CERCLA MUNICIPAL LANDFILL SITES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1990	OSWER 9355.3-11FS	C176

TITLE
CONDUCTING REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES FOR CERCLA MUNICIPAL LANDFILL SITES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1991	OSWER 9355.3-11	C177

TITLE
DRAFT GUIDANCE ON CERCLA COMPLIANCE WITH OTHER LAWS MANUAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/25/1987	OSWER 9234.1-01	C178

TITLE
GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS: THE PROPOSED PLAN, THE RECORD OF DECISION, E.S.D.'S, R.O.D. AMENDMENT. INTERIM FINAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	OSWER 9355.3-02	C179

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND. HUMAN HEALTH EVALUATION MANUAL PART A.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	OSWER 9285.7-01A	C180

TITLE
FINAL COVERS ON HAZARDOUS WASTE LANDFILLS AND SURFACE IMPOUNDMENTS. TECHNICAL GUIDANCE DOCUMENT. DUPLICATE OF C172.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	EPA 530-SW-89-047	C181

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
NATIONAL PRIMARY DRINKING WATER REGULATIONS, SYNTHETIC ORGANIC CHEMICALS; MONITORING FOR UNREGULATED CONTAMINANTS; FINAL RULE. 40 CFR PARTS 141 & 142.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/8/1987		C207

TITLE
NATIONAL PRIMARY DRINKING WATER REGULATIONS; VOLATILE SYNTHETIC ORGANIC CHEMICALS; FINAL RULE AND PROPOSED RULE. 40 CFR PARTS 141 & 142.

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/13/1985		C208

TITLE
DRINKING WATER REGULATIONS; MAXIMUM CONTAMINANT LEVEL GOALS AND NATIONAL PRIMARY DRINKING WATER REGULATIONS FOR LEAD AND COPPER; PROPOSED RULE.

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/18/1988		C209

TITLE
NATIONAL PRIMARY AND SECONDARY DRINKING WATER REGULATIONS; SYNTHETIC ORGANIC CHEMICALS AND INORGANIC CHEMICALS; PROPOSED RULE. 40 CFR PART 141 et al.

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/25/1990		C210

TITLE
NATIONAL PRIMARY AND SECONDARY DRINKING WATER REGULATIONS; PROPOSED RULE. 40 CFR PARTS 141, 142 & 143.

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/22/1989		C211

TITLE
REMEDIAL ACTION AT WASTE DISPOSAL SITES. HANDBOOK.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1982	EPA 625/6-82-006	C212

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND. VOL 1. HUMAN HEALTH EVALUATION MANUAL SUPPLEMENTAL GUIDANCE: STANDARD DEFAULT EXPOSURE FACTORS. INTERIM FINAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/25/1991	OSWER 9285.6-03	C219

TITLE
FINAL GUIDELINES FOR EXPOSURE ASSESSMENT. PGS. 22888 - 22938.

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/29/1992	57 FR 22888	C220

TITLE
REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION.

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1990	SAB-EC-90-021	C221

TITLE
DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS. INTERIM REPORT.

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992	EPA 600/8-91/011B	C227

TITLE
HEALTH EFFECTS ASSESSMENT SUMMARY TABLES (HEAST). FY-1994 ANNUAL.

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1994	PB94-921100	C228

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
RISK ASSESSMENT IN SUPERFUND: A PRIMER. FIRST EDITION. SEPTEMBER 1990.

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1991	EPA 540/X-91/002	C235

TITLE
INTERIM FINAL GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS: PROPOSED PLAN, RECORD OF DECISION, ESD'S, RECORD OF DECISION AMENDMENT.

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1989	OSWER 9355.3-02	C249

TITLE
COMMUNITY RELATIONS IN SUPERFUND: A HANDBOOK.

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1986	OSWER 9230.0-3A	C260

TITLE
ECO UPDATE. ECOLOGICAL SIGNIFICANCE AND SELECTION OF CANDIDATE ASSESSMENT ENDPOINTS. INTERMITTENT BULLETIN VOLUME 3, NUMBER 1

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1996	OSWER 9345.0-11FSI	C268

TITLE
ECO UPDATE. ECOTOX THRESHOLDS. INTERMITTENT BULLETIN VOLUME 3, NUMBER 2

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1996	OSWER 9345.0-12FSI	C269

TITLE
GROUNDWATER USE AND VALUE DETERMINATION GUIDANCE. A RESOURCE-BASED APPROACH TO DECISION MAKING. FINAL DRAFT.

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/3/1996		C273

TITLE
ROLE OF THE BASELINE RISK ASSESSMENT IN SUPERFUND REMEDY SELECTION DECISIONS

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/22/1991	OSWER 9355.0-30	C276

TITLE
RISK-BASED CONCENTRATION TABLE, THIRD QUARTER 1994

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/11/1994		C277

TITLE
FINAL GROUND WATER USE AND VALUE DETERMINATION GUIDANCE

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/4/1996		C278

TITLE
SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

DOCDATE	OSWER/EPA ID	DOCNUMBER
	PL 99-499	C282

TITLE
LAND USE IN THE CERCLA REMEDY SELECTION PROCESS

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1995	OSWER 9355.7-04	C317

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
EXPOSURE FACTORS HANDBOOK; GENERAL FACTORS, VOLUME I

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/1/1997	EPA 600/P-95/002FA	C356

TITLE
ECOLOGICAL RISK ASSESSMENT GUIDANCE FOR SUPERFUND PROCESS FOR DESIGNING AND CONDUCTING ECOLOGICAL RISK ASSESSMENTS (EPA 540-R-97-006)

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/2/1997		C361

TITLE
FRAMEWORK FOR ECOLOGICAL RISK ASSESSMENT (EPA/630/R-92/001)

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1992	EPA 630/R-92-001	C364

TITLE
DRAFT FINAL GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/18/1997		C366

TITLE
TOXICOLOGICAL BENCHMARKS FOR WILDLIFE: 1996 REVISION

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1996		C368

TITLE
TOXICOLOGICAL BENCHMARKS FOR SCREENING POTENTIAL CONTAMINANTS OF CONCERN FOR EFFECTS ON AQUATIC BIOTA: 1994 REVISION

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1994		C376

TITLE
FRAMEWORK FOR ECOLOGICAL RISK ASSESSMENT AT THE EPA

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992		C396

TITLE
HEALTH EFFECTS ASSESSMENT SUMMARY TABLES - FY 1997 UPDATE

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1997	EPA 540/R-97-036	C468

TITLE
EXECUTIVE ORDER 11988 - FLOODPLAIN MANAGEMENT

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/24/1977		C471

TITLE
EXECUTIVE ORDER 11990 - PROTECTION OF WETLANDS

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/24/1977		C472

TITLE
RULES OF THUMB FOR SUPERFUND REMEDY SELECTION (EPA 540-R-97-013)

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/1/1997	OSWER 9355.0-69	C473

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
DRAFT INTERIM FINAL OSWER MONITORED NATURAL ATTENUATION POLICY

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1997	OSWER 9200.4-17	C474

TITLE
USE OF MONITORED NATURAL ATTENUATION AT SUPERFUND, RCRA CORRECTIVE ACTION, AND UNDERGROUND STORAGE TANK SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1997	OSWER 9200.4-17	C475

TITLE
COMMUNITY RELATIONS IN SUPERFUND: A HANDBOOK

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992	EPA 540/R-92/009	C488

TITLE
ALTERNATIVE CAP DESIGN GUIDANCE PROPOSED FOR UNLINED, HAZARDOUS WASTE LANDFILLS IN EPA REGION I

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/30/1997		C495

TITLE
FEDERAL REGISTER, PART II, 40 CFR PART 300 NATIONAL OIL AND HAZARDOUS SUBSTANCES CONTINGENCY PLAN, FINAL RULE, VOL. 55, NO. 46

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/8/1990	NCP PDF or FR	C496

TITLE
NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTIGENCY PLAN; CODE OF FEDERAL REGULATIONS (TITLE 40, PART 300)

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1998		C503

TITLE
FINAL OSWER DIRECTIVE "USE OF MONITORED NATURAL ATTENUATION AT SUPERFUND, RCRA CORRECTIVE ACTION, AND UNDERGROUND STORAGE TANK SITES"

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/21/1999	OSWER 9200.4-17P	C512

TITLE
USE OF MONITORED NATURAL ATTENTUATION AT SUPERFUND, RCRA CORRECTIVE ACTION, AND UNDERGROUND STORAGE TANK SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/21/1999	OSWER 9200.4-17P	C515

TITLE
NATIONAL PRIMARY DRINKING WATER REGULATIONS: ARSENIC AND CLARIFICATIONS TO COMPLIANCE AND NEW SOURCE CONTAMINANTS MONITORING. (CFR, VOL. 65, NO. 121)

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/22/2000		C519

TITLE
REVISED ALTERNATIVE CAP DESIGN GUIDANCE PROPOSED FOR UNLINED HAZARDOUS WASTE LANDFILLS IN THE EPA REGION I

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/5/2001		C524

TITLE
GUIDE TO PREPARING SUPERFUND PROPOSED PLANS RECORDS OF DECISION AND OTHER REMEDY SELECTION DECISION DOCUMENTS

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1999	OSWER 9200.1-23P	C525

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME 1, HUMAN HEALTH EVALUATION MANUAL, INTERIM

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1998	OSWER 9285.7-01D	C530

TITLE
INSTITUTIONAL CONTROLS: A SITE MANAGER'S GUIDE TO IDENTIFYING, EVALUATING AND SELECTING INSTITUTIONAL CONTROLS AT SUPERFUND AND RCRA CORRECTIVE ACTION CLEANUPS.

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/2000	OSWER 9355.0-74 FS-P	C531

TITLE
GUIDANCE FOR MONITORING AT HAZARDOUS WASTE SITES: FRAMEWORK FOR MONITORING PLAN DEVELOPMENT AND IMPLEMENTATION

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/2002	OSWER 9355.4-28	C543

TITLE
GROUND-WATER SAMPLING GUIDELINES FOR SUPERFUND AND RCRA PROJECT MANAGERS, GROUND WATER FORUM ISSUE PAPER

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/1/2002	EPA 542-S-02-001	C544

TITLE
QUALITY ASSURANCE FOR SUPERFUND ENVIRONMENTAL DATA COLLECTION ACTIVITIES, QUICK REFERENCE FACT SHEET

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1993	OSWER 9200.2-16FS	C548

TITLE
HANDBOOK, GROUND WATER, VOLUME 1: GROUND WATER AND CONTAMINATION

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1990	EPA 625/6-90/016A	C559

TITLE
HANDBOOK, GROUND WATER, VOLUME 2: METHODOLOGY

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1991	EPA 625/6-90/016B	C560

TITLE
GUIDANCE FOR MONITORING AT HAZARDOUS WASTE SITES: FRAMEWORK FOR MONITORING PLAN DEVELOPMENT AND IMPLEMENTATION

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/2004	OSWER 9355.4-28	C561

TITLE
ECOLOGICAL RISK ASSESSMENT AND RISK MANAGEMENT PRINCIPLES FOR SUPERFUND SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/7/1999	OSWER 9285.7-28 P	C563

TITLE
ROLE OF THE ECOLOGICAL RISK ASSESSMENT IN THE BASELINE RISK ASSESSMENT

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/12/1994	OSWER 9285.7-17	C564

TITLE
RISK-BASED CLEAN CLOSURE

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/16/1998		C573

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
STRATEGY TO ENSURE INSTITUTIONAL CONTROL IMPLEMENTATION AT SUPERFUND SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/2004	OSWER NO. 9355.0-106	C575

TITLE
FINAL GUIDANCE ON ADMINISTRATIVE RECORDS FOR SELECTING CERCLA RESPONSE ACTIONS

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989	OSWER NO. 9833.3A-1	C576

TITLE
SOIL SCREENING GUIDANCE: USER'S GUIDE

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1996	OSWER NO. 9355.4-23	C577

TITLE
A GUIDE TO DEVELOPING AND DOCUMENTING COST ESTIMATES DURING THE FEASIBILITY STUDY

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/2000	OSWER 9355.0-75	C582

TITLE
REGION I, EPA-NE DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING ENVIRONMENTAL ANALYSES

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1996		C584

TITLE
DRINKING WATER STANDARDS

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/2003		C586

TITLE
SUPPLEMENTAL GUIDANCE TO RAGS: CALCULATIING THE CONCENTRATION TERM

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/1/1992		C587

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND VOLUME I: HUMAN HEALTH EVALUATION MANUAL. PART D. STANDARDIZED PLANNING, REPORTING, AND REVIEW OF SUPERFUND RISK ASSESSMENTS. FINAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/2001		C593

TITLE
PRELIMINARY REMEDIATION GOALS TABLE REGION 9 TECHNICAL SUPPORT TEAM

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/1/2002		C594

TITLE
NATIONAL RECOMMENDED WATER QUALITY CRITERIA

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/27/2002		C597

TITLE
DRINKING WATER STANDARDS

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/2003		C599

EPA Region 1 AR Compendium GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
RISK-BASED CONCENTRATION TABLE REGION III TECHNICAL GUIDANCE MANUAL RISK ASSESSMENT

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/14/2004		C600

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND VOLUME I: HUMAN HEALTH EVALUATION MANUAL (PART E SUPPLEMENTAL GUIDANCE FOR DERMAL RISK ASSESSMENT) FINAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/2004		C602

TITLE
GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1998		C614

TITLE
A GUIDE TO PRINCIPLE THREAT AND LOW LEVEL THREAT WASTES

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1991	9380.3-06FS	C622

The State of New Hampshire
Department of Environmental Services

Michael P. Nolin
Commissioner

August 30, 2005

Susan Studlien, Director
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100
Boston, MA 02114-2023

SUBJECT: TROY – Troy Mills Landfill– Groundwater Use and Value Determination (DES #198405082)

Dear Ms. Studlien:

The New Hampshire Department of Environmental Services (Department) has completed the draft Groundwater Use and Value Determination (Determination) for the Troy Mills Landfill Superfund site (site). The Department used the U.S. Environmental Protection Agency (EPA) guidance document, "Ground Water Use and Value Determination Guidance, Final Draft, dated April 3, 1996," and a memorandum of agreement between the Department and EPA to make our Determination. It is the basis for state and local planning for groundwater use and value in the vicinity of the site for input to Superfund remedial action decisions.

Following the procedures outlined in the above referenced guidance document, the Department has determined that the groundwater in the vicinity of the Troy Mills landfill site is **Medium Use and Value.** Appendix A summarizes the site-specific use and value considerations and the sources of information.

EPA and the Department recognize this Determination should not be used mechanically to direct a particular remedial outcome, but instead should be used as a management tool for remedial action development and selection.

Following the drum removal, and since the drum removal eliminated the primary source of contamination at the site, EPA completed the Remedial Investigation/Feasibility Study on an accelerated schedule,. This accelerated schedule resulted in EPA's Proposed Cleanup Plan (Proposed Plan) before finalizing this Determination. The Proposed Plan was reviewed at the July 20, 2005 public meeting and August 18, 2005 public hearing both held at the Meadowood Assembly Hall in Fitzwilliam. The Department concludes that the Proposed Plan for the site is consistent with this Determination and with past discussions between the agencies and similar use and value determinations at other sites in New Hampshire.

The Proposed Plan calls for establishing a Groundwater Management Zone (GMZ) consistent with the Department's regulations. Installation of groundwater supply wells will be prevented within the approximately 7-acre GMZ. Also, long-term groundwater monitoring will be

implemented both inside and outside the proposed GMZ to confirm that natural attenuation of contaminated groundwater is occurring as expected. Periodic sampling of Rockwood Brook surface water and sediment is also proposed to insure that contaminated groundwater is not migrating outside the GMZ.

If you have any questions on this determination, please contact Carl Baxter at (603) 271-2909.

Sincerely,

Michael P. Nolin
Commissioner

Enclosure: Appendix A

cc: Board of Selectmen, Town of Troy
Town of Troy Health Officer
Anthony Giunta, P.G., Director, DES-WMD
Larry Brill, US EPA w/enc.
James Chow, US EPA w/enc.
Carl Baxter, P.E., DES – WMD, via e-mail
Richard Pease, P.E., DES-WMD, via e-mail
John L. Splendore, P.E, DES-WMD, w/enclosure
Brandon Kernen, P.G., DES-WSE, via e-mail

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APPENDIX A
TROY MILLS LANDFILL SUPERFUND SITE, TROY, NEW HAMPSHIRE
GROUNDWATER USE AND VALUE DETERMINATION WORKSHEET
SUMMARY OF GROUNDWATER SITE-SPECIFIC USE AND VALUE CONSIDERATIONS
AUGUST 2005

FACTORS	HIGH	MEDIUM	LOW	COMMENTS
1. QUANTITY			X	USGS Water Resources Investigation Report 92-4013, Plate 4 estimates less than 1000 square feet/day for overburden sand & gravel transmissivity. NHDES survey results show a 165-foot deep bedrock community supply well in the vicinity with a reported yield of 8 gallons/minute.
2. QUALITY		X		Contamination from the Site has impacted overburden monitoring wells immediately down gradient of the Site. Several shallow monitoring wells at the Site consistently show contamination above Ambient Groundwater Quality Standards (AGQS), primarily for petroleum-based compounds that tend to float as a Light Non-aqueous Phase Liquid (LNAPL) in the shallow aquifer. Deeper monitoring wells at the Site, some of which extend into bedrock, typically have not detected elevated contamination above AGQS. The area is rural residential with a State-lead remediation site in Fitzwilliam, approximately one mile from the Troy Mills Landfill Superfund Site (Site). The community public water supply at the Meadowood Assembly Hall (Meadowood) in Fitzwilliam, about one mile up-gradient of the Site, is under a Groundwater Management Permit. The public water supply and several nearby private residential water supplies near Meadowood are treated for chlorinated contamination attributed to a nearby fire-training center.
3.CURRENT PUBLIC WATER SUPPLY SYSTEMS (PWSSs)		X		The Town of Troy operates a public water supply system that serves the downtown Troy area and vicinity. Public water and sewer extend to residents on South Street for about 1,500 feet south of downtown and about 1/2 –mile northeast of the Site. Troy's public water supply wells and the associated Wellhead Protection Area are in the vicinity of Mount Monadnock several miles north of the Site and are not impacted by contamination from the Site as determined from the NHDES database. As discussed in # 2 above, there is a public water supply for Meadowood, about one mile up gradient to the east of the Site.

FACTORS	HIGH	MEDIUM	LOW	COMMENTS
4. CURRENT PRIVATE DRINKING WATER SUPPLY WELLS		X		The closest private residential supply wells are about 2000 feet or more away from the Site on South Street in Troy and Rockwood Pond Road in Fitzwilliam. At homeowners' requests NHDES tested two residential supply wells on South Street and four on Rockwood Pond Road. No compounds were detected in any of the six residential supply wells tested that indicate an impact from the Site. Based on hydrogeological studies at the Site, NHDES does not believe any vicinity residential water supply wells are impacted by contamination from the Site. The Groundwater Management Zone established for the Site is almost 2000 feet from the nearest residential supply wells.
5. LIKELIHOOD AND IDENTIF-ICATION OF FUTURE DRINKING WATER USE (S) IN REVIEW AREA		X		The area in the Site vicinity is primarily rural residential and new homes continue to be built with on-site water supply and wastewater disposal systems. Continued reliance on bedrock supply wells to support future residential development is anticipated. The contaminated groundwater plume from the Site has not impacted water supplies primarily due to the Site's remote location.
6. OTHER CURRENT OR REASONABLY EXPECTED GROUND-WATER USES (S) IN REVIEW AREA			X	The Meadowood water supply well is considered a "transient" supply and therefore does not have a wellhead protection program associated with it. Groundwater at the Site flows away from the Meadowood supply well, and groundwater contamination above standards has historically been detected immediately down gradient from the Site further away from the Meadowood supply well. The Town of Troy is exploring the feasibility of constructing wastewater treatment plant effluent infiltration basins in an approximately 20-acre area several hundred feet to the north of and down-gradient of the Site. If this were determined to be a viable alternative for disposal of Troy's wastewater treatment plant effluent, it would restrict groundwater use in the area of infiltration.

7. ECO-LOGICAL VALUE		**X**		Contaminated shallow groundwater discharges to an unnamed wetlands abutting Rockwood Brook and to Rockwood Brook. Rockwood Brook flows north about ¾ mile into Sand Pond, which includes the Town of Troy's beach and recreational area. Contamination above standards has not been detected in the Brook as it leaves the immediate Site vicinity.
8. PUBLIC OPINION		**X**		Area residents have expressed concern about the potential surface water migration of contaminants from the Site into Sand Pond. On March 21, 2005, NHDES forwarded for Town review a draft Groundwater Use and Value Determination. Although written comments were not received, informal discussions with the Selectmen Chairman indicated general concurrence with a Medium Use and Value Determination.